

POLLUTION PREVENTION

HEARING
BEFORE THE
SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION
OF THE
COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE
ONE HUNDRED FIRST CONGRESS
SECOND SESSION

APRIL 9, 1990—HARTFORD, CT.

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MONDAY, APRIL 9, 1990

— U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION,
Hartford, CT.

The subcommittee met, pursuant to notice, at 10:15 a.m., in room 1D, Legislative Office Building, State Capitol, Hartford, Connecticut, Hon. Joseph Lieberman (acting chairman of the subcommittee) presiding.

Present: Senator Lieberman.

OPENING STATEMENT OF HON. JOSEPH I. LIEBERMAN, U.S. SENATOR FROM THE STATE OF CONNECTICUT

Senator LIEBERMAN. I want to welcome all of you. This is a hearing of the United States Senate Committee on Environment and Public Works, and I've been authorized to conduct this hearing by the chairman of the Committee, Senator Quentin Burdick of North Dakota, and the Subcommittee on Environmental Protection Chairman, Max Baucus of Montana. I'm grateful to them for allowing me to do that.

Let me just make an opening statement, and then we'll move as quickly as we can to the witnesses.

In two weeks, all around the world, we will celebrate the 20th anniversary of Earth Day. I think it is fair to say that April 22, 1970 marked the beginning of the modern environmental movement. This year, we will also celebrate the 20th anniversary of two very important statutes, the National Environmental Policy Act and the Act that created the Environmental Protection Agency.

Twenty years ago the environmental movement was a pretty colorful mix of students, some that might have then been described as "hippies", Teddy Roosevelt, conservatives, and conservationists. Up to that point in time, I think that most of the people in this Country gave very little thought to the environment as something deserving special attention and protection. In fact, too much of our recent history had been one of environmental exploitation.

But these past 20 years have seen a virtual explosion of knowledge about our natural environment and the impact it has on human health and the impact we have on the environment. Environmental protection has obviously now become a major governmental activity, having an effect on virtually every aspect of our daily lives.

In Congress, we have passed comprehensive legislation protecting surface waters, ground water, drinking water, air, coastal zones,

wet lands, and oceans. The heart of that legislation is an attempt to regulate a tremendous array of industrial, commercial, agricultural and individual behaviors. To protect the environment, we regulate the toxic wastes produced by our industries, the discharges to our rivers, streams and oceans, air emissions from our factories, power plants, and automobiles, the trash from our homes, and the chemicals we apply to agricultural lands and even to our own lawns and trees in our backyards.

We now have environmental protection offices at every level of Government. Many businesses have responded by creating their environmental departments. Citizen groups and grassroots organizations have built up tremendous memberships among people at the local level who have very, very profound environmental concerns. You can find it in almost every poll that you read, but there was a recent Harris poll that indicated that a clean environment is an important issue for 95 percent of the population.

Twenty years ago, when we started this movement—and now we're 20 years into modern environmentalism—we have witnessed some significant victories. I think the visible air pollution that has been choking our cities has diminished. We've just passed the Clean Air Act in the Senate that will help make that even better. Our rivers are no longer laden with the same amalgam of waste oil and debris, and, in fact, we have returned many of them to the fishable and swimmable category. But there again, there's a tremendous amount to be done.

Along the way, I think we've developed a comprehensive environmental management approach, much of it based on what has come to be called command and control, end of the pipe, environmental strategies. We regulate pollution in a pretty comprehensive way now.

Yet many of us continue to be bothered by nagging questions. "Is it all working?" "Is this the best we can do?" "Where do we go from here?"

I think that we now have to reexamine our individual and societal behavior to ensure that we don't leave environmental problems for the generations that come after us.

I'm excited by, and encouraged by, the movement that we're going to explore today, which is the movement for pollution prevention. While we have to continue to control and clean the wastes coming out of society's tailpipes, smokestacks, and sewers, we have to do more to reduce the amount of waste that goes in.

So we're here today, and I'm particularly proud to be here as an extension of the Senate Environment Committee because the State of Connecticut and the other northeastern States—and some of the businesses in our region—are highly visible advocates of innovative pollution prevention strategies.

I've asked the witnesses to address three general sets of questions in their testimony.

First, what is pollution prevention and how does it differ from pollution control? Why is it important?

Second, how can the State, local, and Federal Government work together to make pollution prevention a reality? How does pollution prevention fit into our current environmental regulatory structure?

And third, what are some examples of pollution prevention that are in place and working? What are some examples of pollution prevention that may not be in place, but are on the immediate horizon?

We're interested here in innovations that move our throw-away society to the top of the pollution prevention hierarchy, that is, toward source reduction and environmentally sound recycling.

Pollution prevention, I want to point out, has not been universally accepted in Washington, D.C. yet. There are some who feel that it is an excuse for inaction, and others that feel that it is an alibi for not enforcing the environmental laws. In my opinion, it goes hand in hand with the enforcement of our environmental laws because that enforcement is one incentive that people have to prevent pollution.

But in a more general way, it is also at the heart of what I feel will be a changing environmental ethic, in which all of us in our personal lives, professional lives, and our business lives will take the understanding that we have, that the generations that have preceded us—and to some extent we, ourselves—have acted in a way that is irresponsible, that is not mindful and respectful of the natural environment, and that if we want this planet to be livable and to retain its beauty and purity, and if we want ourselves and our families, and those that follow us on this planet to live safe and healthy lives, we are going to have to—each of us—become participants in a very critical, and I'd say noble effort.

We will do that only if we begin to think, not just about cleaning up the mess, not just about punishing those who create the environmental mess, but about what each of us can do to prevent the mess and pollution in the first place.

That I hope is a theme that we will explore as we go forward with this hearing today. It is one that I am particularly interested in myself.

Again, I thank not only the witnesses, but all of the people who are here. I see that Dr. Gunther is here who has been on the front lines in environmental protection over the years, and others are here as well. I thank you citizens, legislators, and others.

Let's go to the first panel which is composed of Julie Belaga, who I welcome back as Regional Administrator of Region I of USEPA, Leslie Carothers, our Commissioner of the Department of Environmental Protection, and Mary Mushinsky, who is the mother of the star attraction today, who is also, coincidentally, House Chair of the Environment Committee of the Connecticut State Legislature.

I've asked each of the witnesses to try to limit their opening remarks to the general range of five to seven minutes because we've got quite a range of witnesses, and then we'll enter into some discussion.

So, I'm delighted to call on, and welcome, Ms. Julie Belaga.

**STATEMENT OF JULIE BELAGA, REGIONAL ADMINISTRATOR,
REGION I, ENVIRONMENTAL PROTECTION AGENCY**

Ms. BELAGA. Senator, it's an absolute joy to be here.

For the record, I'm Julie Belaga, Regional Administrator of the United States Environmental Protection Agency. I wouldn't have

missed this for a million dollars because I have spent these last three months, since I've been sworn in and taken over the job in Boston, going around the region talking nonstop about pollution prevention. I am so committed to it. It is Bill Reilly's and our Administration's top policy. It is something that they were talking about well before I came on board, and I am excited about it because I am absolutely convinced that this is the one way that we're going to be able to make a difference in our environment for the future.

We are seeing diminishing returns now, as you so carefully described. Pollution controls are not doing the job. Regulating and enforcing is fine and dandy, but it isn't doing the job. So we have to look at a whole new way of dealing with protecting our environment for the future.

Pollution prevention is a strategy for protecting the environment. I also see it as a whole new ethic. I think what we're talking about is a very profound change in the public's thinking in what they're going to look to Government for. I see it as a change in attitudes, in systems, in technologies, and a change in behavior, as you said, for everyone; for corporations, for industry, for academic communities, for municipalities, and for individuals. We all need to take a good hard look at what we're doing to our environment.

What we're going to need to do is to increase our capacity to educate, our outreach, and our technical assistance, but that doesn't mean that we're not going to continue incentives, regulations, and enforcements. But we do have some very stubborn institutional barriers that we're going to have to overcome. Nevertheless, I am convinced that they are overcomeable—if there is such a word.

What we have happening now is that scientists continue to find new ways to pollute and to upset the delicate balance. Treatment and control cannot singlehandedly avert the problems, so we just simply have to stop the waste from getting into our environment in the first place. That is the heart of the matter.

I look at it as a three step phenomenon. We'll talk first about reducing, then recycling, and reusing.

I look at the whole pollution prevention phenomenon as a continuum. We talk about reducing, recycling, reusing, and then on the other end of the spectrum we talk about the treatment control and disposal. Pollution prevention is focusing on those first three, at the front end of that. We want to reiterate that we're not talking about avoiding the clean-up at the end of the pipe, as you so clearly defined, but what we've discovered is that we can no longer afford to do just that.

It isn't doing the job, it is extraordinarily costly, and in the final analysis we often do not clean up the sites sufficiently. So we've got to put this new hat on and start talking about how we're going to stop it in the first place by reducing, reusing, and recycling.

I know that the State has a number of programs—and I don't want to steal their thunder—so I will not go into that, but I would like to share with you that industries have discovered that pollution prevention saves money. It saves them on raw materials, the energy used in their production, the cost of waste disposal, in control technology, and liability insurance premiums. So from the point of view of industry—and I know they're here to talk about

it—we have focused on a couple of metal finishing industries in this State that have done some marvelous thinking, rethinking, and retooling. One of them is the Automatic Plating Company in Bridgeport that put into place a new system to recover 85 percent of the nickel in plating rinses, and they're saving themselves \$129,000 a year.

What is the Environmental Protection Agency's role here? The Environmental Protection Agency is going to work, and will continue to work, with State and local Governments. And I see that as an absolutely critical part of the mix. But it can't just be the Environmental Protection Agency working with the Environmental Protection Agency in each State. It's got to be us working conjunctively with agriculture, transportation, energy people, hospitals, the medical community, schools, Government, municipalities, and individuals. The role that the Environmental Protection Agency can play is in offering technical assistance, information, data research, and then supplementing that with economic incentives and grants.

Obviously we will continue to consider regulations where nothing else works, and where there is a threat to human health. So it's a double barrel approach. But today, I just want to talk about that front end, because I think it is so important.

Region I has done a number of things already. We're very high on this concept. We're playing host to some regulatory programs in the States, and our major programs are addressing ozone precursors and carbon monoxide emissions. We've been working with States on ground water protection, and I will share with you that Connecticut is one of the first States in the Nation to adopt a well health protection program. This is something that I know Commissioner Carothers will discuss, but that is a classic case of pollution protection. We are working towards surface and ground water quality, because once you pollute waters, there's very little that you can do.

So the Environmental Protection Agency is committed to pollution prevention to grants and to support. In the last fiscal year we gave out \$11 million in pollution prevention grants for demonstration projects and technical assistance, and we will continue to do just that.

We have also put in place a Pollution Prevention Council, which is made up of public and private sector citizens, leaders in the field in both Government and private sector initiatives, and we are looking to them to bring us some innovative ideas on how we can reach out to the broad segment of the population. I will keep you posted as to the activities of that group. They have met four times, and I think they have a tremendous future.

In Region I, in house, we have made a commitment to pollution prevention. Is it not for us all to say, "Hey listen, everybody else, you've got to do the job." We have got to do it too, so we have implemented, and had our staff begin thinking about, pollution prevention in program changes, in special projects, in planning and budgeting, in making decisions about what we do on a daily basis, in minimizing the amount of chemicals that we use in our laboratory out in Lexington, advancing identification, and protection of some of the critical wet lands habitat that we have under our jurisdiction.

For example, in New Hampshire and Massachusetts, we've been working on a pollution prevention strategy for the Maramat River Water Shed. They're so numerous that I can't begin to tell you about all the projects. My 25 page testimony will give you some of the specifics, but we are committed to doing the job in house. We recycle our paper, and we want to lead the way.

The States have done some terrific stuff. They will talk about it. Localities have done some terrific stuff too. Here in Connecticut, Eastline was the first town in the State to reach the State's goal of 25 percent recycling. And Greenwich saved \$900,000 in sludge incineration and leaf disposal over 2 years with cold composting.

So we see that people understand the concept. We see these wonderful little bright lights here and there, but what we have to do is to move forward so that there are more of them out there, and more people feel comfortable in the concept.

In this forum, what I'm trying to reiterate is this commitment to the front end to reduce, reuse, and recycle. But I wanted to pick up on something that you said. You said that people in Washington, D.C. are not terribly committed to it. They think that, in fact, it might be a cop out. I will share—

Senator LIEBERMAN. Their feelings are mixed.

Ms. BELAGA. The message I would like to come out of this hearing today is that this is not a pipe dream. This is very doable. We already see the end results where people have made a commitment. Connecticut and the metal finishing industry is a classic case of how very doable this kind of mind set is. It is not simply an excuse for inaction, it is an important component. I'll tell you right now, if we don't begin to think in this fashion, we are all going to drown in our own waste. We have no choice but to put on a new hat and change our thinking and adopt a new ethic. Pollution prevention is that ethic.

In a very short time—I'm talking awfully fast to try to keep within your five minutes—I think I addressed all that you requested. The only thing I didn't address was the question of what's on the immediate horizon. I do know that there is a piece of legislation the Environmental Protection Agency has been talking to you about already.

Senator LIEBERMAN. That's right.

Ms. BELAGA. Nancy Firestone has met with you. There are some pieces of that legislation that I personally am very excited about. I want it to go forward. I don't want it to get lost in the shuffle of reauthorization, and I do hope that we can put in place some of those initiatives. I have those listed.

The one thing that I want to make very clear is that I think it is a coordinated and comprehensive approach to the problem of protecting our environment, but it is absolutely critical that we don't point the finger at everybody else. Each person—each person in this room, each person across this State, and across this Nation—needs to accept responsibility, because unless we all do it together, we are never going to be able to address this problem and we're not going to get to the year 2000 without a lot of very, very serious problems.

Senator LIEBERMAN. Thank you.

Ms. BELAGA. That was a very short period of time for a very comprehensive issue.

Senator LIEBERMAN. I know.

Let me just assure you and the others that your full statement, which I've been over and is excellent, will be printed as part of the record, turned over to the Committee in Washington, D.C., and will be generally available.

I thank you for your statement, and also for what you've done in this short period of time since you've been the Regional Administrator in terms of pollution prevention.

We'll get to questions in a minute, but let me move on to the other two on the first panel.

Leslie Carothers is the Commissioner. I know that you've been involved with some very innovative and path breaking efforts in pollution prevention on a regional basis through the Northeast Governor's Association.

I welcome you once again and look forward to your testimony.

**STATEMENT OF LESLIE CAROTHERS, COMMISSIONER,
CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION**

Ms. CAROTHERS. I don't know whether I can talk quite as fast as my esteemed colleague, but probably I can come close.

There are lots of things that could be characterized as pollution prevention. But I think it's basically programs that attempt to reduce the volume and toxicity of pollutants or waste materials that would ultimately get into the environment. We have a host of programs that could be grouped under that new heading, whether it's IPM, or pulling up underground storage tanks, or even car pooling I regard as a pollution prevention strategy.

Senator LIEBERMAN. Absolutely.

Ms. CAROTHERS. But what I would like to focus on, simply to provide some variety in your testimony this morning, is a very innovative program that was begun by the Coalition of Northeastern Governors with the intent of restraining the growth of packaging as a constituent of solid waste.

I'll mention very briefly the fact that, as Senator Lieberman as stated, there are a number of developments that have led us to the point of focusing on pollution prevention as one of the new coming strategies for achieving a cleaner environment. I feel strongly that we should start out by recognizing some of our achievements where they exist.

I do think that the end of pipe treatment that was imposed in the 1970s and 1980s has had a significant level of success in reducing pollution, and we shouldn't lose sight of that. However, as we worked through those programs, we learned that they had inherent limitations. We tend to move pollution around from media to media. We also discovered that as you reach the 90 to 95 percent levels of control, especially of materials present in low concentrations, getting the last increment out is very tough to do, both technically and economically.

So I think we have been bumping up against some of those limits as we strive to eliminate the last few increments through end of pipe technology.

I think a second factor is that the public is very alert to the dangers of poorly regulated waste disposal—we can only cite dubious environmental landmarks like Love Canal—and the fact that reasonable fears of ground water pollution, drinking water contamination, or health hazards have all resulted in a real phobia on the disposal of waste material.

I think it's hard to blame the public for this feeling. We haven't done a very good job throughout our history of waste disposal, and I think the public is justifiably skeptical that we are capable of building sanitary landfills—which is an oxymoron in my experience—or that waste incinerators will truly live up to their billings as safe and dependable means of disposal for the future.

The last factor that I would mention, and I give Congress a good bit of credit for this, although some States were out front, is the impact of the release of the SARA material disclosing industry's chemical releases to the various environmental media. I think revealing, in quantitative terms, the loading of chemicals that remained after regulation has been one more fact that has helped to lay the groundwork for a new look at what we're doing in regulating pollution.

Now, I want to talk about one specific aspect of a so-called source reduction or pollution prevention program that is going on here in the northeast. If disposal sites are scarce, as they are, if there is still too much pollution going into the environment, there is a lot of pressure to look at mechanisms such as recycling, and ultimately to reducing waste generation at the source. In the northeast, increasing attention is being paid to reducing the solid waste stream in order to conserve land fill capacity, and to limit the need for costly and controversial incinerators.

What we see, when we look at the solid waste stream, is that nearly 30 percent of it is packaging. According to the Environmental Protection Agency publications, the make up of packaging waste in 1986 was 14.5 percent paper, 7.6 percent glass, 4 percent plastics—the fastest growing segment—2 percent steel, a small percent of wood, and less than 1 percent aluminum.

In looking at packaging, of course it has acquired rather bad connotations with people assuming that all packaging is frivolous or silly or just to lure us stupid consumers into buying something that we don't need. But the fact is that much of packaging is intended to protect or preserve a product, or to make it easier and cheaper to stock or ship. Even these legitimate goals can, of course, be over done. The trick is to have enough expertise to figure out what is necessary and what is too much.

To answer some of those questions, and to lay the foundation of a regional packaging reduction strategy, the Coalition of Northeastern Governors, CONEG, through its Environment Committee, made this a priority. I think the results of the two-year initiative have been encouraging, if not downright amazing.

The Coalition made it clear that the goal was a regional program that would get results in reducing packaging, and do so without a proliferation of inconsistent State laws—a program that would seek to set standards in a collaborative way with consumer goods manufacturers, users, and environmental advocacy groups all involved. They've already had some results and more are to come.

Last year, the governors agreed to establish a Source Reduction Council to develop and direct the strategy. That has been done and is now in action.

The Council recommended that each State submit model legislation to reduce the content of toxic constituents in packaging specifically cadmium, lead, mercury, and chromium. I think six or seven of us have introduced that legislation. Here it has been favorably acted upon by the Environment Committee, and we're looking forward to passing it this session.

The Council also agreed to sponsor an education program to improve consumer receptivity. And again, I would second what Julie Belaga has said about the importance of education in having us all rethink some of the things that we've taken for granted in the packaging area. My favorite example that I've used in other speeches is the example given by the Sears representative at the CONEG governor's conference. He pointed out that once basketballs were sold in metal bins. You just picked out the one you like, or that looked like a winner. Now they're framed in cardboard boxes and lined up on shelves. Someone obviously decided that we did not want to buy basketballs that had rubbed up against other basketballs. The question is, why? And how can we break that and other bad packaging habits? One of the CONEG Council's Committees will be considering that.

The last Committee that I want to mention is the Packaging Standards Committee, which has perhaps the most ambitious agenda of all. I am happy to say that that Committee is chaired by Carmen DeBattista, who is head of our Waste-Planning, and Standards Division at the Department of Environmental Protection, so Connecticut is playing a lead role on really the most crucial Committee.

This Committee has a very ambitious agenda. Their goal is to identify the types and amounts of packaging used in established product categories; to develop ways of measuring source reduction in packaging; to establish definitions for source reduction, recycled content, recyclability, recycling rate, recycled material, all of these terms which must be defined if we are going to move toward either consensual or regulatory standards for packaging.

They're also working on a number of other measurement techniques. I want to emphasize that this is being done with the cooperation and, indeed in many areas, the leadership of some major product manufacturers.

The goal is to develop quantifiable goals for packaging reduction, and that these would be adopted as some kind of standard, and that common labels or symbols could be, perhaps, the primary means of securing adherence to the standards. The way it would work is that the States would adopt the standards, and only packages that conformed would qualify for the use of a label. There is going to be a conference sponsored by the CONEG group and the eastern division of the Council of State Governments, a kind of labeling summit, this spring, to try to develop a common labeling strategy that would support and underwrite a standard setting effort.

Obviously if this kind of approach does not get results, then more direct regulatory strategies remain an option.

What I want to emphasize about this is that I would agree with Senator Lieberman's statement that talking about pollution prevention in no way means that we do not continue to enforce vigorously the standards that we have on the books. It's not an "either or" proposition. But the fact is that one of the things we've learned in packaging is that it's very hard for the Government to come in and say "Here's the best way to package this product. Here's the way to reduce it's volume." We're much better at setting end of pipe pollution control standards than we are telling many industries how to wrap up their product to protect it or to sell it. We need the cooperation and collaboration of industry in this area.

Similarly, they need our cooperation and collaboration to avoid a proliferation of inconsistent standards that would make marketing very difficult.

We hope that our objectives in the CONEG project are complementary. I believe they are. The goal is to make recommendations for the next phase of the program and to have some numerical goals by the time that the CONEG governors meet again this fall. That will be the next bench mark.

I will submit for the record the progress report that was just submitted to the governors less than two weeks ago. This one is a draft, and I will get the final copy. I think it would be of use to you and your Subcommittee's deliberations.

Thank you.

Senator LIEBERMAN. Thank you very much.

The final witness on this panel is Mary Mushinsky, the House Chair of the Environment Committee, who has been a leader in this and other environmental areas, and, Mary, I know that you have a global warming bill that I've been telling my colleagues in Congress about because I don't want you to pass yours before we pass ours.

**STATEMENT OF MARY MUSHINSKY, HOUSE CHAIR,
ENVIRONMENT COMMITTEE, CONNECTICUT STATE LEGISLATURE**

Ms. MUSHINSKY. Please don't penalize me the 10 more years of waiting for my bill to pass.

Senator LIEBERMAN. That's right. You probably will pass your bill before we pass ours.

Welcome. It's good to have you.

Ms. MUSHINSKY. Thank you. Thank you for the invitation.

I want to address your questions in the order that you presented them here.

You asked, what is pollution prevention and how does it differ from pollution control? In my mind, this would be changing manufacturing and consumption patterns so that waste is not produced at all, rather than regulating waste disposal later. The reason that it's important—for the obvious—it saves resources including trees, minerals, clean air, clean water, land, and also money when viewed over time.

It also avoids dependence on foreign sources, whether they be oil or mineral. And finally, it avoids social conflict over waste siting. We have had some very vicious battles over siting solid waste facilities, hazardous waste, ash, wood chip plants, and soon to come,

low level radioactive waste sites. These battles have happened since 1985 to the present. And if your other senators in other States have not seen it yet, they will see it. We are a densely populated State, but the other States will catch up, and you will see these siting disputes elsewhere in the United States.

On your second question—how can the Governments work together? The way it seems to work is that States are doing the experimenting and then the Federal Government picks up on a national basis. The States have worked with the packaging laws. Bottle bills have started at the State level, and you were one of the sponsors here in Connecticut, so you'll remember that. Energy efficient appliances start at the State level. Water saving devices—toilets and so on—have all started at the State level.

You're seeing pressure at the State level for cleaner cars that surpasses what the Federal Government has asked for, and hopefully that pressure from below will change the Federal law.

Obviously though, the Federal Government is the better place for these types of standards and Congress should pick up on Nationwide standards for more fuel efficient cars. I was very distressed to see that struck out. I know you didn't vote that way. You voted to keep it, but you lost. That was very upsetting to see the fuel efficiency taken out of the Clean Air Act. That really sets us back.

We would like to have Nationwide standards for packaging and for newsprint recycling content. What we've been doing is to pass our own standards from State to State, which doesn't make a lot of sense. It would help the recycling industries if it was more uniform.

For bottle deposits, for battery deposits, water conservation devices—a Massachusetts toilet should not be different from an Illinois toilet or from a Florida toilet. We should all have the same water saving standards for our plumbing.

Another way that we can all cooperate—all Government, State, Federal and local—can work to change markets, and use our procurement leverage as buyers to help reuse. This Country, unfortunately, was blessed with resources, so we've tended to be a Country not based on recycling. We're built on exploiting resources and short term profit, which makes it a tough nut to crack.

Another thing that the Federal Government alone can do is to try to change the tax code to discourage waste. As a general rule—I'm not that familiar with the tax code—but as general rule, it seems that virgin materials get a better break whether it be trees, oil, or whatever, over secondary materials. That really has to be reversed. One thing that could be done right away would be to raise the gas tax.

I know you're raising your eyebrows. That you think I'm crazy is shown by the expression on your face. But you wouldn't have to do it right away.

Senator LIEBERMAN. I wouldn't think of it.

Ms. MUSHINSKY. Okay.

The way to do it without causing a major disruption is to do it over time so that people know it's coming. You could do it by saying, "Three years from now there will be a rise in the gas tax of 50 cents, and in another three years it will be another 50 cents, and another three years it will be another 50 cents." So if manufac-

turers see it coming, they can start to prepare fuel efficient cars, better oil burners, and so on, and it is not such a hardship for the citizens if we know in advance that it's coming. If you did it immediately, it would be a hardship, especially in a cool weather State, like Connecticut.

On your second question—fitting into the regulatory structure—this is the area where I'm weakest, but I would think that you could use the existing Environmental Protection Agency procurement regulations, for starters, to do some purchasing for the Federal Government that favors recycled materials. You could also—this could be a bill in Congress—set regulatory fees based on emissions. My Co-chairman, Steve Spellman is tinkering with an idea like that in Connecticut. The idea would be to reduce the fees as they bring the emissions into compliance, and in the meantime you would use this pool of money that you're collecting for source reduction loans.

So in other words, you're sending the manufacturers a message that it should be more costly to pollute than to source reduce. Right now, in their eyes, it's cheaper to do one over the other, but you can reduce that with a fee policy.

In the final analysis, the way to make source reduction happen is to make the alternatives to source reduction worse, and that is more expensive or more difficult. And this would happen in Connecticut.

When I was first elected in 1981, I put in a mandatory source reduction bill and it failed immediately. There was some public support for it, but local Government opposition was tremendous as it was more expensive than the open dumping that was then common.

The bill was introduced again by four of us in 1987 and it did pass. The reason that it passed in 1987 and not in 1981 is that the towns in Connecticut had finally run out of cheap land fill—the nearest land fill was in Ohio—and the alternative waste to energy technology was very unpopular in most towns. So, you have to make the alternatives to source reduction worse than source reduction, and then you will steer folks the right way.

And finally—examples of pollution prevention—I'm just going to give you a list, but will submit the bills separately in writing.

These are already law in Connecticut—but the one that you worked on in 1978, the Bottle Bill—in 1987, mandatory recycling—we recycle eight items in Connecticut.

Is that right, eight?

Nine? We added one, that's right.

In 1988 we had a promoting recycling law, which is basically a procurement law that has the State starting to work to help the markets. In 1989, we passed a packaging law. That's the one that the Commissioner referred to where she is going to be regulating packaging after October 1991. That's tied to the CONEG regional guidelines. Also in that law is a requirement that newspapers use recycled content. Also in 1989, a chlorofluorocarbons law that Representative Levine did on auto air conditioners and packaging. And also in 1989, the Governor did three bills on water conservation which included a lot of these energy efficient plumbing, shower-heads, and so on.

The bills that are pending this year on source reduction, that I can think of, are newspaper amendments fine tuning last year's, a bill of chlorofluorocarbons in auto air conditioners, and also another bill on halogens which is another ozone hole chemical. There's a very large bill of global warming, which is my personal top priority. This includes energy efficiency standards for State buildings and cars, and disincentives for inefficient private buildings and cars. It's done through the rate structure and tax policy. There are also a couple of minor bills on cloth diapers, junk mail, and lead acid battery deposits.

We will submit all the bills to you and the written information. I appreciate your interest in prevention, and I hope that it spreads to your colleagues.

Senator LIEBERMAN. Good. Thank you.

Let me ask the question—again this is going back to my own experience—when the Bottle Bill was passed we really didn't recognize that it was pollution prevention on an ad hoc basis. I just wonder now, as the State, through the Legislature, has moved to this more general recycling law, has there been any question raised about whether the particular bottle system ought to be repealed? In other words, is there any question about whether the system of deposits and collections are necessary as we move to the more general municipal recycling system?

Ms. MUSHINSKY. Well, the original opponents including the food stores, would still like the bill to go away, so they have raised that possibility.

Senator LIEBERMAN. Have they?

Ms. MUSHINSKY. But the Bottle Bill has a—well, there's two reasons why I would prefer to keep it. First is that it's a more pure system to just cycle the stuff back immediately to the store and then the manufacturer for remanufacture and you avoid the contamination problem of recyclables which happens when you have a mixed stream, and then you have to separate that mixed stream. That's one advantage.

The other advantage is that the bill also served to reduce litter. Senator LIEBERMAN. That's right.

Ms. MUSHINSKY. And that is still true. If you took the deposit off now, you would have the littering problem again with the containers. So for those two reasons I would keep it.

Senator LIEBERMAN. That makes sense.

Commissioner, let me ask you—I'm fascinated again by what the northeastern States are doing—what kind of response are you getting from the industries involved? I guess more generally I'm wondering what mechanism is available for enforcing these guidelines or statutes since you're dealing with products that are pretty much nationally distributed?

Ms. CAROTHERS. First of all, we're getting a lot of cooperation not only from industry, but also from major environmental organizations who are members of the council. Some of the leaders in this area have been Procter & Gamble, Scott Paper, Sears, some of the computer manufacturers who, of course, have a specialized packaging problem of shipping sensitive equipment. Clearly it's perceived as being something of mutual benefit because, as I indicated, they

would like to be out front so that they have some impact on what the standards are.

But I also think it's clear that some of them, like Procter & Gamble, see this as a possible marketing opportunity. We're all for that.

Senator LIEBERMAN. So you're not finding that the industries involved are lobbying against these bills at the State level and saying that it ought to be done nationally?

Ms. CAROTHERS. No, I'm not saying that they aren't lobbying necessarily against the collection that Mary mentioned, I'm saying that they're supporting the regional initiative that we're undertaking.

Senator LIEBERMAN. They are.

Ms. CAROTHERS. Again, in terms of how these standards might be enforced, it may be that we might attempt to see what would happen if we used a more market oriented enforcement mechanism. We would set the standards, provide in all the northeastern States—a market of \$50 million—that you can't use the—whatever we agree as a logo—unless you meet those standards and then see if market pressures alone will induce major packagers to comply with those standards. If that were tried and did not work, then you would have the option of making the standards directly applicable.

Those decisions and recommendations are only in the formulation stage, and I'm sure all the governors will want to chew on that. It's viewed that the label itself—having to comply with certain uniform northeastern standards to use the label—could itself exert significant pressure on major product manufacturers. So that's one way.

Senator LIEBERMAN. This is interesting. Because of the size of the market, it's a little like the role that California has played with cars. Is that what you're saying?

Ms. CAROTHERS. We agree completely. And, again, there certainly is an argument, which we understand, for national uniformity in terms of certain kinds of products that are marketed nationally. On the other hand, the only major legal or policy argument against that is that it's not reasonable to segment the market into 50 little markets. But the northeast, as I say, is 50 million people. It's our view that even if the rest of the Country did not follow suit—and we're of course hoping that they will if we develop a good program—that it's not unreasonable to expect marketers to target a particular packaging to that region if that's what's necessary.

Senator LIEBERMAN. Is it fair to say that what you're hoping for ultimately is national packaging guidelines?

Ms. CAROTHERS. I certainly think that would be desirable, and I would respectfully suggest that this effort in the northeast be regarded as some sort of a pilot to see if this collaborative approach really does generate results in terms of goals and quantifiable measurements of what we could achieve, which would then be adopted on a broader scale.

I might add that the National Governors Conference has also taken up the solid waste issue and this packaging issue, and many of the governors, including ours, who are active on this issue in CONEG, are also active at the National Governors Association level.

So I think it may demonstrate things that can't be accomplished, but I think it will demonstrate some things that can be accomplished also.

Senator LIEBERMAN. Thank you.

Julie, I know some people, in approaching pollution prevention, have said that the regulatory agencies—whether Environmental Protection Agency or State agencies—are going to have to change the way that they're organized. In other words, most agencies are organized along so-called single media lines—air, water, solid waste, et cetera—and for pollution prevention to work, some of those lines may be burned.

For instance, some people, as I'm sure you know, have suggested that we ought to, when it comes to an industry, issue a multi-media permit—one permit to cover a lot of things, flexible in one area to gain in other areas. I'm curious how you feel about that whole question.

Ms. BELAGA. We really do see that as the move for the future. What we have done in the Environmental Protection Agency in just these last few months have been to try and take a hard look at what we do right now with the laws on the books, if you will, and in terms of making decisions about how we spend our money. How can we shift those dollars so that we look more consistently across the board?

The word multi-media means very little to the man on the street. Our industry, as you know, is water, waste, and air—how can you really think of each one in a vacuum? You're absolutely right. We have got to take a broader look and see if we have limited enforcement people to go out. I know that they're doing some interesting things in Massachusetts already, a pilot project, to send their people out to do permitting across the board for both air and water permits.

I think we have got to start looking at that, Senator. We have got to look at the decision making in a multi-media fashion. You cannot any longer look at each thing in isolation. But the truth is that this is an enormous bureaucracy that is very comfortable functioning that way.

Senator LIEBERMAN. Right.

Ms. BELAGA. When I suggest to you that it is a real change in mindset, it isn't just for the individual, the private citizen, it will also be for a bureaucracy which has been very comfortable functioning in segmented arenas. We've really got to get beyond that.

Senator LIEBERMAN. Yes. I appreciate that answer.

What I'm hearing from each of you is that you're finding, each in your own area, that there is public, and in that sense private, responsiveness to this idea of pollution prevention. That is, that people are aware—people and businesses—and they are responding to this idea. Is that fair to say?

Ms. BELAGA. I'll tell you that I think the public is alarmed.

Senator LIEBERMAN. Yes.

Ms. BELAGA. And one of the extraordinary things that's happened this year with Earth Day, and all the reattention, if you will, to these issues—the public is very concerned. The kinds of questions that I get all the time are, "What can I do?" So if individuals are concerned about this, and industries are concerned because of

the enormous list of regulations that they have to comply with, we really have a setting for the public sector, private sector, industry, and corporations to take a good long hard look. I think people are alarmed. They want to make a difference. They know that we're right there on the cutting edge right now. If we don't change our mindset we really have only ourselves to blame. I think the time is very ripe.

Senator LIEBERMAN. I thank you. I don't know what your schedules are like. If you can stay, that's great, if you can't, we understand. If you can stay, we'll probably end with some open discussion later on, but it's totally up to you.

Thank you for being here. Thank you very much for your testimony.

The second panel is composed of Douglas Foy and Susie Crimmins who are here in a somewhat different way, but I think they obviously share the same goals. The position and the system is a little bit different.

Douglas, why don't you begin. This is the Executive Director of the Conservation Law Foundation.

We thank you for being here.

STATEMENT OF DOUGLAS FOY, EXECUTIVE DIRECTOR, CONSERVATION LAW FOUNDATION

Mr. Foy. Thank you, Senator, I'm pleased to be here this morning.

I would like to focus my brief comments on energy efficiency which, as you have pointed out quite clearly, may lie at the heart of much of our pollution prevention strategies. Indeed, if we can improve the efficiency with which we use energy in all sectors, we will have enormous impacts on air, water, solid waste, and pollution problems of many sorts.

I'll use this room as an example. I was in this room two years ago and commented on the lights and they're still the same. This room has in excess of 100 150 watt flood lights in the ceiling that are wasting 75 percent of the electricity that they're using.

Senator LIEBERMAN. Why don't you explain what you mean by that?

Mr. Foy. Senator, these are incandescent flood lights. This is a compact fluorescent light, which I'm sure you've seen before, which is the new energy lighting technology. This light uses about one-fourth of the electricity that a typical incandescent light uses, generates the same amount of light, the same quality of light, lasts 10 times as long, but will essentially save the customer \$50 on lighting bills and on replacing incandescent lights. It will also displace—this bulb alone—will displace a ton of carbon dioxide emissions. One ton. Two thousands pounds of CO₂ from this bulb because power plants don't have to run as long or as hard to generate the electricity to run the lights.

This room is wasting 75 percent of the electricity that is presently going into its lighting. It is also wasting 25 percent of the electricity that is going into its air conditioning system because it's having to cool these lights. That is an enormous pollution prevention opportunity that is essentially being missed here.

Ms. MUSHINSKY. I wrote it down this time.

Mr. Foy. Good.

Senator LIEBERMAN. What did you say, Mary?

Ms. MUSHINSKY. I wrote it down this time.

Mr. Foy. She wrote it down this time. [Laughter.]

The last time that I was here, two years ago, was to announce a truly innovative program with Northeast Utilities to begin a utility effort to invest directly in energy efficiency where the industry buys the equipment to fix these rooms and buildings like this building.

That direct investment program has grown all over New England to the point that we now have New England utilities spending \$200 million this year on energy efficiency, and possibly \$500 million within two years on an annual basis.

We estimate that New England can save between one-third and one-half of all the electricity that we use simply by taking advantage of the best technology out there, and installing efficiency. That will not change our lifestyle. It will improve our competitive position because our energy bills will drop, and pollution will drop dramatically from the electricity.

Senator LIEBERMAN. Why isn't that happening now?

Mr. Foy. I think it is starting to happen. There are two reasons why it hasn't happened. One, efficiency was always looked at as a customer problem. If it was on my side of the electric meter, it was my problem to make my house more efficient.

Senator LIEBERMAN. Right.

Mr. Foy. It's the State's problem to make this building more efficient.

On the utility's side of the meter, it was their problem to build the power plants. What we've done is to change that principle so that the utility industry is now to be concerned about both sides of the electric meter. If they can save electricity—mine efficiency from this room at a lower price than they can build power plants—then they should mine the efficiency here.

If this light bulb is cheaper, aggregated a million times over—if they install a million light bulbs—and they can get the same amount of power from those light bulbs for a cheaper price than they could build a power plant to generate it, then they should install the light bulbs.

Senator LIEBERMAN. Let me just ask you to draw that out a little bit, because the conventional wisdom over the years was that the average utility wanted to sell more power. In other words to expand their market.

Mr. Foy. Yes.

Senator LIEBERMAN. So, how did that all change?

Mr. Foy. Well, Senator, I'm not sure that it has completely changed. The way that it should be changed, and the way that we are moving to change it, and indeed in Massachusetts and Rhode Island there are now rulings in the commissions that regulate utilities that were issued within the past two months—Massachusetts a week ago—that allow utilities to profit from energy efficiency.

Traditionally a utility that came into this room and installed these light bulbs would lose money because their sales would drop, and their return is entirely a function of sales.

What you want to do is to reward utilities for aiding their customers in efficiency just as you reward them for selling electricity. Indeed, when Edison founded the electric company, he sold light. He did not sell electricity. He was pushed out by his Board of Directors because they wanted to sell kilowatt hours. What you want to do is to bring the utility industry full circle back to its roots. They should sell light. If they can sell light to this room more cheaply than they can have this room waste electricity, then let them sell light.

That's the change. What you have to do, though, is to pay them for that. The way it's done is very simple. Attached to my testimony is a chart which shows how this is done. The utility company comes in and installs the lights. Let's say that the lights cost them \$1,000. That \$1,000 goes into their rate base and they get a return on it just as if it's a \$1,000 power plant. That makes them, in theory, ambivalent to doing efficiency or doing power sales. But they still have to make a profit on it. This allows them to get their money back, if you put it in the rate base. What you want to do is to make it profitable.

So what you do is to give them a share of the savings. Let's say that the new lights save the State, in this room alone, \$50 a year in electric bills. Give the utility company \$5 of that. It's a profit. The State saves \$45 so the State's happy, the utility makes \$5 more than it could have made building power plants so it's very happy, and all customers win because we're not building more expensive power plants. We win two ways our elective bills are lower, and environmental quality improves because those power plants are not running.

That change has to be made.

Senator LIEBERMAN. What's the status? Where are we along the road to that change? Is it happening in Connecticut, Massachusetts, and other places?

Mr. Foy. It's not happening in Connecticut yet, I'm sorry to report, and indeed some of the negotiations in Connecticut have largely broken down. The utility is very willing and very interested, but there is a fair amount of bureaucratic resistance to some of the changes.

Senator LIEBERMAN. At the PUC?

Mr. Foy. More at OPM, Senator.

Senator LIEBERMAN. In the State OPM?

Mr. Foy. Yes.

As a consequence, I think Connecticut really had been the leader on energy efficiency two years ago. In fact, when we were here for the first press conference, it was the first utility that had really made a move on this.

Senator LIEBERMAN. Yes.

Mr. Foy. Northeast Utilities is a very thoughtful company. Connecticut was really out front, and I must say that I think they have become the caboose on the train. Massachusetts, Rhode Island, and Vermont are now well ahead of Connecticut.

Senator LIEBERMAN. Those States are moving ahead in this now?

Mr. Foy. No doubt. Massachusetts and Rhode Island have both adopted the profit incentive already. It's in place and utilities are making profits on investments. Vermont will shortly do the same

thing. And we expect that Maine and New Hampshire will follow, particularly New Hampshire because Northeast Utilities and New England Electric—both companies that are pretty enthused about this—are now major operators there.

Senator LIEBERMAN. What about elsewhere in the Country?

Mr. Foy. California is just moving in that direction, based on the New England model. Those are the only States that have any kind of profit incentive in place.

My recommendation to you, Senator, would be that this is something Congress could immediately correct by simply requiring all utility commissions under PURPA, or under the Clean Air Act, to adopt a profit incentive. If you adopt a profit incentive, our estimate is that the utility industry will turn 180 degrees on its attitudes toward efficiency. It may take a couple of years, but money talks. If you make this a business for them, an area where they can make more money at lower risk—all these light bulbs are not going to blow up at once. Seabrook may. These are a much lower risk. This is a terrific investment.

Senator LIEBERMAN. So what you're finding is receptivity in the utility industry to this idea?

Mr. Foy. No doubt. In fact, you could replace me with the chairman of New England Electric and he would say exactly what I have said. Indeed—I believe that your staff has it—but I could certainly submit a copy for you. This is a copy of a program that you may well have seen, Power by Design, which is New England Electric and our joint design efficiency programs. It reads like we wrote it, but they wrote it. They are very enthused, and I think you will find the thoughtful utilities throughout the Country are very enthused.

They see that their future is not in capital intensive projects. They have trouble building power plants now. It's hard to site them. They know that CO₂ problems are coming down the road at them. They know that CO₂ problems are coming down the road at through the roof. They don't want to build power plants.

Senator LIEBERMAN. Right.

Mr. Foy. Senator, if I could turn—my testimony explains in some detail where the efficiency opportunities are in the electricity sector, which is one-third of all energy use. I know that I'm running over, but I would like to make one comment about transportation, which I know is also of great interest to you.

Senator LIEBERMAN. Yes, please do.

Mr. Foy. Transportation is also about one-third of our energy use in America, and the source of vast amounts of air and water pollution. Just a few numbers. America has 135 million cars, two times the number of cars that we had in 1960. We're 5 percent of the world's population and we own 35 percent of the automobiles in the world.

The car represents 82 percent of all urban trips—in other words, people driving in the city—versus 50 percent in most of the rest of the world. Half of those trips have one passenger, a 2-ton vehicle moving one passenger.

Transportation consumes 63 percent of all the oil in America, two-thirds of all the oil in America. We use 16 percent more oil today than we used in 1973 in our cars. In other words, with the doubling of

fuel efficiency, we're still burning more oil because we drive more. The vehicle miles traveled are way up over where they were before the Arab oil embargo.

The car emits its weight in carbon each year of its life. Cars are involved in all five greenhouse gas emissions; carbon dioxide, methane, nitrous oxide, chlorofluorocarbons, and ozone.

They are also responsible for five of the six criteria pollutants under the Clean Air Act; 41 percent of all nitrogen oxide emissions, 41 percent of all volatile organic compounds, 70 percent of all carbon monoxide.

Half of all the land in American cities is devoted to the transportation sector, either roads, parking lots, or service stations. Two-thirds of all the land in Los Angeles is devoted to transportation, and fully 10 percent of all arable land in America is covered with roads or with gas stations—10 percent of all arable land.

Twenty-five percent of all the service station gas tanks are leaking—1.2 million gas tanks—polluting water supplies today.

Cars are solid waste problems, tires, batteries, lead, the whole thing. Congestion costs us billions of dollars a year. In Boston alone, it cost us \$2 billion a year. Cars are an enormous pollution problem.

Our feeling is that the single most important thing that could be done on pollution prevention is to deal with electric utility pricing and how the utilities are rewarded, and deal with the automobile. We must begin to view the automobile as a pollutant—the automobile. Not its emissions—although they are clearly pollution—but car as a pollutant. We must begin to deal with management of that pollutant.

I know this is an area of great interest to you, Senator. We welcome the chance to work with your staff on this issue. I do not believe that there is really any comprehensive thinking being done on how to deal with the car. The CAFE Standards are one option—

Senator LIEBERMAN. Right.

Mr. Foy [continuing]. But they're only one. Pricing—Mary has mentioned gas taxes. I'll give you another example. Parking is too cheap. The average parking space—87 percent of all parking in America is free. The employers who provide it deduct it as a tax deduction. The employees who receive it do not report it as income. It should be. It is a benefit and should be reflected as such.

So you have pricing, you have CAFE Standards, and the third and most important is that you need a paradigm shift on the way that we view mobility. You must confront America with the fact that the way that we've planned our transportation system is to allow our highway engineers to decide what to build and where to build it. And then we build buildings scattered all over the Country, and then stuff highways into the landscape to try to get people there. You must start to figure how to get people to where they need to go before you build the buildings in the first place.

Senator LIEBERMAN. I appreciate your testimony on both counts. The effort that you've made with electric energy is one of the best examples of pollution prevention that we've got, and there's a lot more that we can do with it. I'm going to take your idea back to Washington, D.C. about what we might do to help.

Secondly, on transportation, you're absolutely right. I talked about this at several points during the Clean Air debate. We actually have in the bill a modest proposal which is aimed at basically encouraging larger employers to spend as much encouraging to ride share or to use mass transit as they do on making it easy for them to drive a single car and park it in a lot, either on the grounds or have their parking paid by the employer, because you're right. The automobile industry came in and said to us during the Clean Air debate, "Look, we've cleaned up the cars so much since the last time that you considered the Clean Air bill, there's very little more that we can clean up."

But two answers to that one is that they really, in effect, weren't cleaned up that much, but secondly, as you said, we're driving more cars further, longer. Even with the reduced emissions from the cars under this Act that just passed the Senate, when you begin to hit 2000 it all goes up again, and pretty seriously, because we're driving more cars. So we have a real job to do there with incentives and psychology because of our love affair with the car.

Mr. Foy. I agree.

Senator, if I may make one final point, one of the simplest things we could do would be to simply try to calculate the true cost of the automobile, the true operational cost, which includes the Navy in the Persian Gulf defending the oil lines, all the water supplies in America polluted from gas station leaks, all the air pollution, and all the congestion caused. If that were internalized and the cars priced accordingly, or the use of the cars were priced accordingly, the market would generate an entirely different kind of transportation system than what we have today.

Senator LIEBERMAN. I agree. Thank you.

Susie Crimmins is the Regional Recycling Coordinator for the Capitol District Council of Governments and she brings that perspective to this discussion of pollution prevention, a real-life practical perspective.

We thank you, and look forward to your testimony now.

STATEMENT OF SUSIE CRIMMINS, REGIONAL RECYCLING COORDINATOR, CAPITOL REGION COUNCIL OF GOVERNMENTS

Ms. CRIMMINS. For the record, my name is Susie Crimmins and I am the Recycling Coordinator for the Capitol Region Council of Governments, a regional planning agency and policy organization comprised of local municipal Governments in the Capital region. I provide regional coordination recycling efforts and technical assistance to the 30 towns in the Capital region, 4 towns in the Windham region and 8 towns in the midstate region. In all, the region I serve has over 800,000 people in 42 communities.

Prior to working at the CRCOG, I was staff to the Municipal Solid Waste Recycling Advisory Council here at the General Assembly and the Packaging Task Force. During this last year, I served as a member of the Newsprint Recycling Task Force. If you don't have a copy of the final report of the Newsprint Recycling Task Force, I will leave you a copy. I think it's a very important discussion of the issues regarding increasing the use of recycled content in newspapers.

Towns in my regions are working diligently to establish collection systems for bottles and cans, newspaper and corrugated; establish composting sites and leaf collection; set-up drop-off sites for waste oil, auto batteries, and scrap metal; develop local ordinances and establish enforcement mechanisms; and develop critical public education.

All this costs money. But solid waste is too much of a problem for the local communities. It is one of the most troublesome issues facing these local communities. It's often one of the fastest growing budget items, using up more and more of their local resources—resources which they could be using for education, recreation, streets, roads, libraries, or social services.

But solid waste disposal is one of those things that they can't avoid spending local municipal resources on, so they're doing it.

They are committed to establishing comprehensive recycling programs. The level of involvement of town officials from public works departments has been extraordinary. It's been very impressive and very gratifying.

I want to give you a funny story. I meet with my public works directors every month. They understand what source reduction means. They bring their own mugs to my meetings. These are public works directors. It's not because they're trying to save trees. They're doing it because they recognize that we have meetings in a host community and that host community has to pay for and handle the disposal of the garbage generated in that community. So they understand it from their own point of view which is not saving trees or preserving fossil fuels, but from preventing that municipality from having to do that much more garbage pick up.

Citizens are ready and willing to cooperate with recycling and reduction measures by sorting their recyclables from their trash. In the towns which have established curbside collection systems, participation rates, set out rates, and volumes collected have far exceeded expectations. In the recently opened Springfield, Massachusetts materials resource recovery facility—the IPC in Springfield—the first problem encountered was that far more materials were delivered to the facility in the first month. It wasn't that they weren't getting enough, but that they were getting too much.

However, there are barriers to either successfully fulfilling the full potential of recycling or source reduction. Some of these barriers cannot be addressed at either the local or regional level, and must be addressed at the State or Federal level.

To use the energy conservation analog, back in the early 1970s, at the time that people were saying that we need to conserve energy, people were saying, "We'll ruin business." "We'll bring economy to a halt." "We can't do it." Once energy prices came up then opportunities began to show themselves very clearly to various actors in the system. In fact, some of the greatest energy conservation took place at manufacturing levels where the guy panning for the electricity was the guy in a position to reap the benefits of saving.

Unfortunately, with solid waste disposal, the guy generating the waste isn't always the direct payor of the disposal costs. Sometimes it is the municipality. When a product is designed with a sealed in nickel cadmium battery—a dust buster, a cordless screwdriver—

then the person designing that appliance is not the person paying for the disposal of that appliance. It's way down the road.

Similarly, when a newspaper publisher publishes a newspaper, that company is not the one paying for my cost as a consumer of disposing of that newspaper once I've read it. So the analogy only goes so far with energy conservation, but the benefits are the same. What we need to do is to be able to bring the cost back to the sources of the problem.

Senator LIEBERMAN. What do you think are the best ways to do that?

Ms. CRIMMINS. There are a couple of things. One is in the deposit—you asked about the deposit law. Interestingly enough, from a municipal point of view—although the thought of getting our hands on that wonderful, valuable aluminum which is worth \$900 to \$1,000 a ton is very seductive—the municipalities are not paying for the trucks to collect those cans. They are not paying for the manpower to sort those cans. They are not paying for the crushers or balers for those bottles and cans. They are not paying for the shipment to the end users. They're not bearing the risk of it being a contaminated load.

So when all is said and done—my gut feeling without having done any detailed analysis—is that we can forego the aluminum for now, in exchange for the fact that the generator of those materials—the wholesaler, the seller, the people who profit from the manufacture and the sale of these products—are the ones bearing the costs of their disposal. In this case it's not disposal, it's recycling.

That's one way that the cost can be put back. The Automobile Battery Bill would be the same way where the automobile deposit system would allow those actors which are benefitting from the sale of automobile batteries to be, in effect, paying for the collection and the return.

We need to make people more aware of what they're paying. I often go out to businesses who have said, "Gee, maybe we ought to start thinking about how we're going to do recycling." The first thing I do is to take the executives from the company out back to the dumpster, and I try to teach them to follow their garbage. We walk. We go to the dumpster and open it up and I show them what's in it. Often they don't know. Often they're not aware of how much they're discarding. I then try and walk them back through their business and see where these materials are coming from, and what they are.

Then I start giving them a clue as to how much these materials are worth. If I see reams and reams of computer print out—it's worth between \$200 and \$400 a ton if it's in sufficient quantity. That gets a businessman's attention, that he is paying \$5 to \$50 a ton for disposing of something that has an intrinsic value, a positive value, not a negative value.

Senator LIEBERMAN. That's a very interesting story. That sounds very similar to what might otherwise be called an environmental audit, which is one of the concepts that people are talking about as part of a pollution prevention strategy. That is, to require companies to do environmental audits, and then to set up a goal or a plan to act on those audits.

Occasionally during my time as Attorney General, and I'm sure it's being done now as part of settlements, when a company had violated the laws to do an environmental audit into the future, we would include that requirement to make sure that they didn't do it again.

Ms. CRIMMINS. I think it's very beneficial to have places of business do it, but the problem is that I don't think we have the resources at a regional or State level to adequately give the assistance to them to analyze the results of a formal audit. I think it would be better spent teaching them the benefit of informal audits. They don't have to be very formal. You just have to identify what your waste stream is, where its coming from, where's the best place to segregate it and give the assistance. The businesses have been very cooperative. Recently in Bristol region they did a survey—and I just heard a quick press report on it—but they said that the percentage of business people who recognized the need to do recycling was the same as the percentage of citizens who recognized the need, and that was 84 percent. People who work in Connecticut, live in communities in Connecticut, and if they live in a community in Connecticut, then they know that waste disposal is a real problem.

The problem we have is that the composition of the waste stream is changing and we can't keep up. The municipalities cannot keep up with the changes. Every time the waste stream changes, our collection systems and recycling systems have to be adapted.

Senator LIEBERMAN. You mean that it's not just growing bigger, it's—

Ms. CRIMMINS. It's changing.

Senator LIEBERMAN [continuing]. In what way?

Ms. CRIMMINS. I'll give you some changes in my life time. Refillable glass milk bottles have been replaced with single use cartons and plastic jugs. Aluminum cans have been, to a large extent, replaced with plastic liter bottles of soda. Washable cloth diapers have been replaced with plastic disposable diapers. Cars used to be steel, primarily. Now they're made up of composites, aluminum, plastics, all kinds of material, and each time you have a more complicated mix of materials, the harder it is to recycle a given product.

Most of the plastic and synthetic materials in the waste stream didn't exist 30 years ago. They simply did not exist. There have been new resins developed every five years. Not all plastic is alike; not all metal is alike; not all paper is alike in terms of what you can do with it. You would never dream of treating a silver christening cup the same as a tin camping cup. We understand there's a difference, although they're both metal, that we would have to handle them separately. We have to learn that we have to handle different kinds of plastic differently. We have to handle different kinds of paper differently. Newspaper doesn't have the same characteristics or value that computer print out has.

The waste stream keeps changing. We can't keep up with it. We have disposable things that were never heard of before—disposable razors, cameras, disposable everything—these things didn't exist 15 years ago.

We can teach consumers how to identify materials as long as they're readily identifiable, and how to separate them, but we can't constantly keep changing our collection systems to adapt to ever changing waste streams.

We need to make the responsibility of the waste stream fall back on the generators and the producers. The guy who designs the appliance with the sealed in nickel cadmium battery needs, in effect, to pay the price or understand the social or actual cost of disposing of that item.

Connecticut did pass a law last year that bans nonremovable nickel cadmium batteries from appliances after a certain date. This is one State's effort. That's something that should be done nationally because that cadmium is a source of cadmium for the incinerator ash. So that is a problem.

We are the Saudi Arabia of waste, we export more scrap metal—the two largest exports out of the port of New York are scrap metal and waste paper. Once we learn to start separating out materials, we have to stop thinking of all waste as being alike. We need to differentiate between materials that can be segregated and recaptured, and waste. Then we have to understand that not all waste, once it's identified as waste, is identical and needs the same management strategies. Our State and Federal policies should reflect those distinctions.

The reason that I'm so adamant about source reduction is that I see what is happening to my municipal budgets. They're spending a lot of money to establish recycling, but they can't keep up with ever growing amounts of municipal wastes at the municipal local level.

Some of the things the Federal Government can do is to immediately establish an affirmative procurement policy for products made with recycled content. That includes a price preference. A policy without a price preference is not a policy at all.

You need to immediately establish segregation and collection of recyclables in all Federal facilities and agencies. One of the most useful things that I've had is to be able to take office managers to the State's Department of Environmental Protection to physically show them that it is physically possible to collect white office paper from a very crowded office. The Federal Government can be doing it yesterday. They should be doing it yesterday in every Federal facility. There is no reason why they should continue to burden the local communities that serve as their hosts with having to dispose of all that material that should not be waste.

Senator LIEBERMAN. We are working on that, and hopefully, through a Pollution Prevention Bill, we will be able to get the Federal Government to play more of a leadership role in this.

Can I ask you to wind up in this?

Ms. CRIMMINS. Yes.

A couple of other areas where the Federal Government is to eliminate the support for use of virgin materials over recycled materials.

Senator LIEBERMAN. Right.

Ms. CRIMMINS. Also to support the State efforts to reduce waste at the source and at product manufacture.

Senator LIEBERMAN. Thank you. Thank you for your testimony.

It takes us to a good transition to our final panel which is composed of people who are involved in business and, in that sense, involved in the business of pollution prevention. That's part of the broader business, and I thank them for coming.

Again, I say to Mr. Foy and Ms. Crimmins, you're welcome to stay if you'd like and participate or react as this goes on.

The first witness is Mr. Ron Van Mynan, who is the Vice President for Health, Safety, and Environmental Affairs at Union Carbide. I'm looking forward to your testimony to hear about the specific work that you're doing with plastics, and so far as time allows, more generally how Union Carbide as a corporation is approaching internally the problem of pollution prevention.

Thank you for coming.

STATEMENT OF RON VAN MYNEN, VICE PRESIDENT FOR HEALTH, SAFETY, AND ENVIRONMENTAL AFFAIRS, UNION CARBIDE

Mr. VAN MYNEN. Good morning, Senator Lieberman, ladies, and gentlemen.

I am pleased to share our views on the important subject of pollution prevention. A copy of my written testimony and additional exhibits have been submitted for the record. I am going to do them in the reverse order, but I think I'm going to stay within my seven minutes.

We believe that a continuing program of pollution prevention is essential both for Union Carbide and really for all of industry. The public demands it, business economics require it, and above all, it's the right thing to do, as we have heard over and over again this morning.

We believe that a continuing program of pollution prevention is the only way to go. Over the last several years our domestic chemical plants have made significant progress in reducing waste generation and chemical releases to the environment.

I have some statistics. Between 1985 and 1988 our chemical plants reduced the amount of potentially harmful chemicals released to the air by 45 percent. Between 1982 and 1988, the same plants reduced the amount of RCRA—the Resource Conservation and Recovery Act—hazardous waste requiring treatment by 68 percent while our production over that same time frame went up by 12 percent.

On the municipal side, our corporate headquarters in Danbury recently initiated one of the first comprehensive corporate programs in Connecticut for recycling paper. We all now have two wastebaskets under our desk, one for recycling with a road map on it telling you what you can put in and what you can't, colors and other things. In the first six months that we have had this program going we have saved 450 cubic yards of land fill space, and spared the equivalent of 2,500 full grown trees and reduced our waste disposal costs by a third. The program will pay for itself in the first year, so it's certainly the right thing to do.

We've also done many other things. We have defined pollution prevention to include all activities—in answer to your first question—we've defined pollution prevention to include all activities

that reduce or eliminate waste generation and the release of pollutants to the environment from our processes. We strive to accomplish this through a hierarchy of waste management practices that include, as we've heard earlier this morning, source reduction—that's the way to go if you can—and then environmentally sound recycling and reuse, and finally, safe on-site waste treatment practices.

We've made substantial progress in reducing waste generation and environmental releases through source reduction and recycling practices, and we believe that there is still room for much progress to be gained. However, we recognize that source reduction and recycling also have limitations. As a consequence, safe treatment options, as well as environmentally sound waste storage and disposal practices, will continue to be important components of our environmental protection strategy. We'll really need all the elements.

Our waste minimization program is an example of pollution prevention that is in place and working. We adopted a corporate policy in 1983 that requires all of our locations to have a waste minimization program in place, to understand where the waste comes from, how much per pound of product, and what we can do to reduce it. The policy also requires that we address waste minimization as we design new processes, do new research, and undertake new operations.

Other important elements of our waste minimization program include the development and annual update of waste management strategic plans. Where is it that we want to go? Second we need senior management support in the form of goal setting and providing the human and dollar resources and monitoring performance.

You've met with our chairman, Bob Kennedy who has championed the CMA responsible care initiative which has an aggressive release reduction and waste minimization mandatory practice code. To be a member of CMA you're going to have to sign on to these principles and practice codes and make it happen.

We also need a strong motivation and participation of all of our employees. The last element is doing minimization audits and assessments. Since 1987 we have mandated that every one of our major capital projects undergo a formal Waste Minimization Opportunity Review as a part of the approval process. As a result, additional waste reduction measures have been incorporated in over 45 percent of the projects that we've reviewed. So obviously the first pass through them didn't have all the incentives addressed.

Our pollution prevention efforts extend beyond the boundaries and into the products, services, and technologies used by our customers and the general public. One example that we've shared with the press, which was widely picked up three or four months ago, was our UNICARB system for spraying paints and coatings. By substituting recycled carbon dioxide—not new molecules but molecules that we can capture from other processes—for organic solvents. The emissions of smog producing chemicals from commercial and industrial spray paint and coating operations can be reduced by 30 percent to 70 percent. This takes a special formulation of the paint and we've already gotten a lot of the major paint companies to see that this is a super opportunity to support emissions

reduction and improve our air quality. They are now formulating paint for this system, and we're licensing these systems.

There are a whole host of other examples in our written testimony, and also a lot of literature and brochures that we have left with you.

At Carbide, pollution prevention also means never being satisfied with the status quo. We're really committed to a process of continuous improvement. It will never all be perfect at one snap of the finger, but you've got to watch us as we make progress, I believe.

In late 1988, for example, our senior management set a series of waste reduction goals that call for, among other things, the ultimate elimination of emissions of known and suspect carcinogens from our facilities, and the establishment of a culture that keeps waste minimization at the top of the priority list as we design and operate our facilities. We're only going to be as good as our people are every hour of every day as we operate our plants.

We have teams of business, operations, and technical people working to identify opportunities and implement projects and activities to achieve our environmental goals which we believe are quite ambitious. The results have been very encouraging, and many source reduction opportunities have been identified.

The magnitude of the reductions that we expect to achieve is also encouraging. Using the SARA Title 313 data as a basis, we expect to reduce chemical releases to the environment and waste shipments off-site by 57 percent by 1993. And you can see that we just put up the stair steps there. We've already done 12 percent, and we're going to do another 45 percent in the next four years, in calendar years 1990, 1991, 1992, and 1993. This is very ambitious and will probably cost us in the neighborhood of \$100 million a year to do these kinds of things.

This 57 percent improvement includes a 67 percent reduction in releases to the air, water, and land, and a 30 percent reduction in waste shipments to commercial treatment and disposal facilities. These projections are based on our best judgment of what technology and business conditions will allow. Obviously it assumes that we're running the same processes that we have and that people are buying those products.

Of all the pollution prevention activities that are underway at Carbide, plastics recycling may offer the most immediate and direct benefit for the people of Connecticut. And, frankly, we need their help to make it work.

We're in the process of constructing a multi-plastics recycling facility at Piscataway, New Jersey. Besides processing rigid containers, such as milk jugs and soda bottles, the facility will also process flexible wrap and film. So we will be able to take shrink wrap from pallets and these kinds of things, and this milk jug, so it is easier to carry, was stepped on by a six year old and that was able to get that pretty much flatter so that we could carry more of those on each truck. We're putting it at Piscataway because it's right next door to our research facility there, so I think it will be very helpful.

What we will do then, is that we will be able to produce resins like these pellets from the recycled material, and ultimately we can convert these into another reusable container like this bottle

that we can recycle again. This could be used for soap, bleach, or whatever.

Initially, we hope to draw on a tri-State area, including Connecticut, for our raw materials, also New York and New Jersey. Longer term, though, we hope to serve areas within a 500 mile radius from Piscataway. As Jim has put up there, you can see that takes us out to Ohio, West Virginia, Virginia, and other places. It will cover nearly 40 percent of the United States population. We have capacity at that site to triple the volume that we could handle. So we're aggressively moving in that area. I think that's right in sync with some of the testimony that you heard earlier this morning.

There are some barriers, though, that face this new business which are not as much physical as they are human. We really know how to recycle plastics. We have the technology, skills, and more critically, the markets for recycled products. There are people who will buy recycled materials. We can have the right cost mix and that kind of thing to make that happen. The big problem is the lack of recycled materials. Too few communities are including plastics in their curbside collection programs. Many of them—as Susie said earlier, there are nine issues she's addressing, but plastics wasn't one of those. They were glass, paper, aluminum, scrap metal, batteries, leaves, and whatever else it was, but not plastics, unfortunately.

Connecticut does not include plastics on its mandatory recycling list. In New Jersey, I believe eight out of 21 counties do that. So we're making progress there. I would hope to make progress here also.

Senator LIEBERMAN. Is the problem that people have thought that plastic was not easily recyclable?

Mr. VAN MYNEN. That may be part of it. We may have an education problem. I think also that it's the difficulty of all the segregation—

Senator LIEBERMAN. Collecting it all.

Mr. VAN MYNEN [continuing]. Collecting trucks, and the number of containers you have to put out at the curb and all those kinds of things.

Senator LIEBERMAN. How pioneering is the work that you're doing at this New Jersey facility? In other words, is there anything else like it around the country?

Mr. VAN MYNEN. Yes. Our competitors are also very involved in this—Dow Chemical, you've heard of Dupont and Chemical Waste Management having a joint or the waste management parent company—

Senator LIEBERMAN. Yes.

Mr. VAN MYNEN [continuing]. There are many companies that are doing this. We are not unique in this area. A lot of the plastics companies are moving forward in this area. This is the responsible thing to do.

Senator LIEBERMAN. I'm going to talk to Mr. Jansen in a minute about the market for recycled paper which people have raised questions about, but in your mind, if people begin to present plastic products at the curbside, that there's no question that there is a market—

Mr. VAN MYNEN. That's correct.

Senator LIEBERMAN [continuing]. To take them and recycle them.

Mr. VAN MYNEN. And we could use them for a variety of things which you've heard about. We could make a conduit for various things, electrical or whatever else, drainpipes, plastic furniture, auto parts, or whatever.

Senator LIEBERMAN. I presume that you're getting into this not only because you're a responsible corporate citizen, but because you think this is going to be a profitable business.

Mr. VAN MYNEN. Absolutely.

Senator LIEBERMAN. Let me just—on that tone, before I go on—some of the more general pollution prevention steps that you've taken are interesting to me because you've achieved substantial reductions. Now I suppose some of them where you're dealing with carcinogens—we hope that you'd exercise some good citizenship and try to cut down on that because they hurt people and make them sick. Some of them are not as obviously dangerous to health, and I think the general notion would be that unless forced to do so by regulation, law, or enforcement, generally that business would prefer to go along doing what is convenient, and presumable less costly. So why—after all you are a business, you're not a Government institution or a public service—why did you get into these steps to reduce pollution?

Mr. VAN MYNEN. We'll only be allowed to operate as long as we're a good neighbor and people perceive us as that. I think that's a thrust for CMA's responsible care initiative. We're going to do it in product stewardship, how we transport our products, and release reductions so we don't have spills and emissions, and we're going to do it in waste minimization. We're going to do it in all realms of our business.

The 174 companies of CMA—and you may have seen some of their ads. I think Washington Post is about to have one, USA Today had one last Tuesday. We're listing the names of the companies. We want to be responsible and move forward. It doesn't have any magic numbers. There is no law or rule at CMA that we have to hit 57 percent by 1993, but I have to make credible progress on all the issues. We think that's the only way that we'll be in business in the year 2000.

Our company spends 15 to 20—more often 20—percent of all the dollars we spend in manufacturing costs and in our capital programs for health, safety and environmental issues. We don't want to duck those issues. We think it's very important to move forward and to get those kinds of things behind us. As Julie Belaga said earlier, that will reduce our liability costs. In addition to being a good citizen, we'll have a much higher quality business, and we need to move on with that.

Senator LIEBERMAN. That's a very important statement. I appreciate that. Clearly part of what you're saying is that there is a public expectation here, and if you don't meet it, it will affect everything else that you do.

Mr. VAN MYNEN. We can't continue in that way.

Senator LIEBERMAN. Right.

Mr. VAN MYNEN. One of my last points, of course, is that we would certainly like for Connecticut to include plastics in all of its recycling activities as we move forward.

The other thing, of course, is that if we really are going to exist on into the future—as I've said somewhat here and anecdotally—we need to effectively focus our facilities, research, and our energies on the new products and the services that will improve our environment and our quality of life.

You'll see in the brochure that we've put out that we've got a whole series of technologies, whether its around recapturing chlorofluorocarbons, or cleaning SO₂ out of the new Clean Air Act mandated acid rain issues.

Our company has long learned that we need to be environmentally compatible with our policies. We've been licensing the UNIPOL technology and have about 30 percent of all the polyethylene plants around the world using that technology. It uses significantly less energy and capital, and it makes almost nil waste. It's a clean process. At source it almost has no waste at all.

Just one other point, and that is that we've all got to remember, whether we're businessmen, government people, activists, or whatever it might be, that we have not inherited the earth from our parents to do with it what we like. Instead we have borrowed it from our children for a few years so that we might preserve it for them.

Thank you. I was very pleased to be here to testify at this hearing this morning. Thank you again for the invitation. I'll be glad to answer any other questions.

Senator LIEBERMAN. Thank you very much.

I want to welcome the latest infant to the hearing, and say that I suppose if there's any hearing at which it's appropriate to have infants, it is this one because we're talking about what their future is going to be like.

Ray Jansen is the Senior Vice President and General Manager of the Hartford Courant, and we're delighted to have you here. I know the Courant has been involved in some interesting experiments with recycling and pollution prevention.

I cannot restrain myself from saying, Ray, that it has been a couple of days recently when I was in Washington, D.C. and received my Hartford Courant and read the editorial, that I wanted to destroy the paper—

[Laughter.]

Senator LIEBERMAN [continuing]. But instead, realizing the importance of pollution prevention, I dropped it into the recycling bin that's right beside my desk.

So anyway, thank you for being here.

STATEMENT OF RAYMOND A. JANSEN, JR., SENIOR VICE PRESIDENT AND GENERAL MANAGER, HARTFORD COURANT

Mr. JANSEN. Good morning, Senator Lieberman, and I appreciate that. [Laughter.]

Senator LIEBERMAN. It had nothing to do with your part of the paper. [Laughter.]

Mr. JANSEN. I commend you for holding this hearing and thank you for the invitation to testify.

This forum presents a genuine opportunity to familiarize you with the viewpoint of the newspaper industry. It also offers the public and private sectors a chance to explore each others' goals

and concerns. By doing so, business and Government can work together in a constructive manner for the protection of our environment.

It is no secret that publishing a daily newspaper requires a great deal of newsprint, paper. In 1989, for example, the Hartford Courant consumed about 46,000 metric tons of newsprint. This represented about 37 percent of the newsprint used by all daily newspapers in the State.

It's also no secret that newspapers are a significant component of the solid waste disposal problem facing our society. Newspapers are said to comprise approximately 7 percent of the solid waste stream in an urban northeastern State such as Connecticut.

What has been treated as a secret, however, is the news that we are not dealing with a hopeless environmental situation here.

First, we have a strong base to build on in that 35 percent of the newsprint used in this Nation is already being recycled. And, secondly, we should be able to move this figure to approximately 50 percent by the end of this decade without causing serious dislocations in either the newspaper publishing or newsprint manufacturing industries.

Let's now take a look at a few facts and figures to get an understanding of the dimensions of the situation we face.

In 1988, the last full year for which figures are readily available, 13.6 million tons of newsprint were used in the United States. 65 percent of this, or 8.8 million tons, unfortunately, was discarded. But 35 percent, or 4.8 million tons, was reused.

Of the amount recycled, 1.4 million tons was used to produce newsprint that contained recycled fibers. Another million tons was exported to Europe and Japan to be used in the production of newsprint. And the largest share, 2.3 million tons, was used to produce a wide range of products, such as cardboard boxes, various paper and boards used in construction, egg cartons, cellulose insulation, and mulch products.

Last year at The Courant 1 percent of the newsprint we used contained recycled fibers. In 1990 we are committed to raising this percentage to at least 8 percent.

Since February 1, the message you see displayed on the easel to my left has appeared on page 2 of our newspaper virtually every day. In fact, there have been only 10 days since February 1 when at least part of The Courant was not printed on recycled paper. You also see displayed here an ad that we will be running to let readers know that they can find this information on page 2 in an effort to let readers know that it is recyclable.

We are not alone in making this type of progress. Most newspapers in Connecticut and around the Nation are committed to making greater use of recycled newsprint.

This in turn is putting new pressure on newsprint manufacturers. The newspaper industry's message to newsprint manufacturers has been strong and clear: We need more recycled newsprint. In fact, The Courant just told one of our six suppliers that we will cancel our contract with them if they do not start taking this message more seriously.

But the supply of newsprint produced with recycled fibers cannot be increased overnight. And a dramatic increase in supply will not

suddenly appear just because we want it to or just because State or Federal Governments pass laws requiring it.

At the present time, there are eight mills in the United States and one in Canada producing newsprint with fibers reclaimed from old newspapers. I might add parenthetically that newspapers receive paper from mills within a reasonable distance. In other words, eight mills across the country does not mean that newspapers in New England have access to the paper in all eight of those mills. Meanwhile, there are 40 mills in Canada and about 15 in the United States producing what is known as virgin newsprint from fresh wood pulp. It will take time for the newsprint manufacturers to alter this balance and produce more tons of recycled newsprint.

Senator LIEBERMAN. Is that 40 in Canada, or 40 in the United States?

Mr. JANSEN. That's 40 mills in Canada, and 15 in the United States.

Senator LIEBERMAN. So the bulk of the newsprint is still coming from Canada?

Mr. JANSEN. The bulk of the newsprint for the Nation comes from Canada. An overwhelmingly majority of the newsprint for New England newspapers comes from Canada. For instance, of our six suppliers, we have one major supplier in the United States from Maine. We are currently getting recycled newsprint as well from New Jersey. But the balance of our newsprint comes from Canada.

Senator LIEBERMAN. And you said earlier that there are eight mills in the United States that are taking the recycled paper?

Mr. JANSEN. Yes.

Senator LIEBERMAN. Then one in Canada?

Mr. JANSEN. Yes.

Senator LIEBERMAN. So obviously they're not moving very far toward the recycling there. I assume it's an important industry to them.

Mr. JANSEN. It's an important industry and also the one mill in Canada that is producing recycled newsprint is owned by an American company.

Senator LIEBERMAN. That's interesting.

Mr. JANSEN. That's owned by the Tribune Company of Chicago.

It will take time for the United States and Canadian manufacturers to gear up and make the recycled newsprint because it requires multi-million dollar investments in new plants and equipment in order to meet the objective. It will also take time because the market must work out a system for getting newspapers that have come out of our refuse stream back to recycling plants.

This brings us to the critical question: What is the proper role of the Federal Government in helping to increase the supply and use of recycled newsprint?

The answer, Senator, is a limited role. Why? Because the issue is being addressed with Federal action through the workings of the free market or in some cases, like Connecticut, with the development of voluntary State guidelines.

There is, without question, a growing national consensus in favor of environmental protection. And all of us in the private sector are hearing that message just as loud and clear as you and your colleagues in Washington, D.C.

In the face of this clear public sentiment, the newspaper industry would only be courting disaster to ignore its vulnerabilities. Newspapers that want to grow and prosper must move to use recycled paper. Those who don't will suffer the consequences.

In States such as Connecticut these free market realities are being bolstered by voluntary agreements between State Government and newspaper publishers.

The model agreement now moving its way through the State legislature here sets a reasonable timetable for phasing in the use of greater levels of recycled newsprint. This agreement authorizes Government sanctions only if newspapers fail to meet the timetable. The agreement also recognizes that the timetable can only be met if market conditions have made a sufficient supply of recycled newsprint available at a competitive price.

The newspaper industry, then, is ready to be a part of the solution to the solid waste disposal crisis facing the Nation. What's needed is time for the market to respond to this demand with increased production capacity. This is not a situation that requires Federal regulation or legislation.

I have spent a great deal of time here discussing recycling, because it is the most visible environmental issue facing the newspaper industry today. But, as a business we deal with a host of environmental concerns every day.

I'd like to very briefly discuss some of these issues and The Courant's approach to them. By doing so I can demonstrate that American businesses have opportunities to take steps that will benefit the environment while improving their bottom line performance.

Here are the examples: The Courant is installing an ink reclamation system. What this means is that we will recapture excess ink that remains on our presses and reuse it by mixing it with fresh ink. At present, this excess ink is put in barrels when its cleaned off the presses. The barrels are then transported by an Environmental Protection Agency approved company to an out-of-State concrete plant where the contents are burned for energy. All of this is done at a cost to us of \$60,000 a year.

Our new ink reclamation system will pay for itself in five years. By recapturing and using excess ink instead of disposing of it we are also contributing to a cleaner environment.

The Courant has already installed, at a cost of \$1 million, devices called spray bar dampeners. This new equipment allows us to obtain the proper mixture of ink and water more quickly in the printing process. This means that when the presses are started, we will produce the high quality papers we need with less waste. We estimate this will save 270 tons of newsprint a year. Based on this and other assumptions, we see this system paying for itself within four years.

Finally, I'd be remiss if I did not mention that in expanding and renovating our building across the street, we made certain that all of our toilets comply with State and local codes on water conservation. This is helping to conserve water and reduce strains on the city's waste treatment facility.

It's also worth noting that we've reduced our energy needs for cooling and heating on a per square foot basis.

Senator, someone once said that for every complicated problem there is a simple solution. That doesn't work. Environmental protection is certainly a complex problem. And it's clear that we need to move beyond simplistic solutions. Our best hope lies in business and Government working together to find realistic solutions to the environmental challenges we face.

A very simple solution, and this would help you when you discard your paper, The Hartford Courant or otherwise—

[Laughter.]

Mr. JANSEN. I'd like to leave this with you and your staff.

Senator LIEBERMAN. Thank you.

Mr. JANSEN. The Courant is making these available at cost to anyone who wants them so that their papers can be kept neatly and properly tied up so that they can be disposed of.

Senator LIEBERMAN. That's great. My wife thanks you as well as I thank you. [Laughter.]

I appreciate your testimony.

Mr. JANSEN. That concludes my testimony.

Senator LIEBERMAN. Let me just ask a couple of questions briefly. I was interested, again, in your testimony that some of the pollution prevention recycling that you're doing is not only positive environmentally, but is going to pay for itself in a relatively short period of time, so it makes business sense as well as environmental sense.

Let me just ask you about that aspect of recycled paper. How is that working for you now? When you buy paper that has recycled paper in it, is that at a price advantage, is it neutral, or is it a loss?

Mr. JANSEN. It's neutral.

Senator LIEBERMAN. It's neutral.

Mr. JANSEN. It costs no more or no less.

Senator LIEBERMAN. Yes.

Mr. JANSEN. The one recycled mill in the northeast, which is Garden State in New Jersey—

Senator LIEBERMAN. Right.

Mr. JANSEN [continuing]. Has priced it's product very competitively with virgin pulp.

Senator LIEBERMAN. Let me go back to an earlier part of this. This is not really your responsibility, but you may know about it. There is an impression growing that the public is so willing to recycle papers—that basically means to put them out on the curbside—that the volume being presented in that way is greater than the capacity of the mills that can take paper and recycle it. Is that true?

Mr. JANSEN. I believe that's true.

Senator LIEBERMAN. Yes.

Mr. JANSEN. As a matter of fact, I think there's a rather critical problem in the Washington, D.C. area.

Senator LIEBERMAN. No doubt. That's not a surprise.

Mr. JANSEN. Right now—several years ago, we used to receive \$35 to \$40 a ton for waste paper.

Senator LIEBERMAN. Right.

Mr. JANSEN. We now are paying approximately that to have it taken away.

Senator LIEBERMAN. And that's the experience, I know, of the municipalities, which is unfortunate. And that's all because of the

fact that there aren't enough mills to take the paper and recycle it, is that correct?

Mr. JANSEN. That's correct.

Senator LIEBERMAN. Go ahead, Susie.

Ms. CRIMMINS. There's some bright light up there on this issue. About five major paper mills have announced their plans to expand their capacity to use recycled newsprint partially as a result of Connecticut's mandate that the newspaper's consume recycled newsprint. In recent weeks, two agents have been soliciting 10 to 20 year contracts paying a positive price from large scale collectors of newsprint. The price at the end user market has been improving a few dollars a week for the past 10 weeks.

I think that the ice is broken. I think we're going to see market improvements. The question is, will those improvements be sufficient to meet the additional 95,000 tons annually that we will be collecting annually over and above the 110,000 tons annually that are currently collected? Will the market break in time for January of 1990, is really the main question, not will the market break.

Senator LIEBERMAN. You mentioned Washington, D.C. It is true of Mark Mahoney, as the staff of this hearing reminds me, that apparently the municipal Government in Washington, D.C. is picking up recycled papers and just dumping them in a pit for now because they're not prepared to pay for them to be taken away—

Mr. JANSEN. Right.

Senator LIEBERMAN [continuing]. And they're waiting and hoping for someone to buy them.

Mr. JANSEN. Picking up on Susie's statement, we have been approached by one of those company's wanting a long term contract. As a business decision, we are not going to sign any long term contracts because we are convinced that the price per ton is going to grow that we're seeing out there. We believe that it's going to grow rather dramatically. So anyone that signs a 10 year contract right now will feel good only for a short period of time.

Senator LIEBERMAN. That's correct.

I'd love to keep this up, but we're coming up to the end of the time that we have and I want to give some time to Kathy Golas, Chairwoman and Executive Officer of the Connecticut Hazardous Waste Management Service. She is accompanied today by three folks who have worked with the Service and have achieved some extraordinary results in pollution prevention.

Kathy, and gentlemen, welcome. We look forward to hearing from you now.

STATEMENT OF KATHLEEN GOLAS, CHAIRWOMAN AND EXECUTIVE OFFICER, CONNECTICUT HAZARDOUS WASTE MANAGEMENT SERVICE, ACCOMPANIED BY CARL R. WHEELER, PRESIDENT, SEABOARD METAL FINISHING COMPANY, INC.; JAMES W. DeWITT, PRESIDENT, CONNECTICUT RESOURCE GROUP, INC., AND EXECUTIVE DIRECTOR, CONNECTICUT ASSOCIATION OF METAL FINISHERS; AND JOHN R. HEALY, SENIOR PROJECT ENGINEER, THE TORRINGTON COMPANY, DIVISION OF INGER-SOLL-RAND

Ms. GOLAS. Thank you, Senator Lieberman.

Pollution prevention offers practical solutions to problems, solutions that have positive benefits and that we can afford to implement.

The Connecticut Hazardous Waste Management Service has been working since 1984 in a nonregulatory manner to help business and industry to find ways to comply with environmental laws; to protect public health and the environment; and to keep Connecticut business doing what it needs to do, employing workers and making profits.

As the Service has gone about its task, we have watched pollution prevention evolve. It is not a revolutionary concept, but it is one that works best when Government, industry, and environmentalists take a longer term view.

The three people accompanying me today are available to answer your questions. Each is familiar with the generation of hazardous waste. Each has shown his commitment to proper management. And each has a unique perspective on, and direct experience with, pollution prevention.

With me today are Carl Wheeler, President of Seaboard Metal Finishing Company of West Haven, a family-owned metal finishing operation with about 40 employees and \$2.5 million in annual sales; James DeWitt, President of the Connecticut Resource Group and Executive Director of the Connecticut Association of Metal Finishers; and John Healy, Senior Project Engineer for the Torrington Company, a division of Ingersoll-Rand with more than 2,000 employees in its Connecticut operations.

Carl Wheeler, Jim DeWitt, and Jack Healy are part of the story of how pollution prevention has worked in Connecticut. They can tell you how their searches for answers to hazardous waste problems led them to pollution prevention. This is what people are now referring to as a "win-win" situation—a cleaner environment along with bottom line cost savings for industry.

What these men know firsthand is that pollution prevention works. They have found ways to alter practices at the front end and to avoid the use of hazardous materials. The results are the elimination of, or reduction in, the production of hazardous byproducts.

They have sought multi-media approaches. In other words, they have looked at air, water, and land pollution instead of focusing on only one. With pollution prevention, unlike pollution control, shifting the problem for the smokestack to the landfill isn't considered solving the problem.

Pollution prevention can be accomplished with something as simple as a housekeeping change or as involved as setting up an entirely new process.

Pollution prevention is fail safe. In contrast, cleaning up a problem at the end of a pipe—which is what pollution control does—is inefficient and leaves the environment and business vulnerable to mistakes, breakdowns, and liability.

Pollution prevention has come through evolution. It makes sense in terms of protecting the environment and adding money to the bottom line for business, but it didn't just happen.

We would not have moved to pollution prevention without the tough Federal and State laws enacted during the past 20 years.

Those laws provided economic and other incentives for changes in hazardous waste generating and handling practices. Unfortunately, in some case, those laws merely shifted the pollutants from water to land or from air to land.

These laws which were passed one by one over the past 20 years were the result of an evolutionary process of environmental protection. Now it is time to step back and reassess what has happened. It is time to take a more comprehensive look at environmental law—to consolidate, to integrate, to eliminate inconsistencies.

This will not be easy. The existing bureaucracy itself is probably the most significant barrier. But it's well worth doing. Pollution prevention—which is already happening—will be accelerated. And, hopefully, environmental law will make more sense.

According to the Office of Technology Assessment, nearly everyone agrees that prescribing waste reduction through regulation is technically infeasible and administratively impractical.

Aggressive enforcement of existing law coupled with voluntary efforts by business and industry are needed. More technical and financial assistance is needed for companies that don't have the knowledge or the resources to tackle the job themselves.

Local and State programs seem to work best. They should be supported with Federal dollars.

The Connecticut Hazardous Waste Management Service is an example of the use of a nonregulatory approach to pollution prevention. We have local knowledge. Our track record, working closely with Connecticut business, includes some of the successful pollution prevention efforts in Connecticut.

I'd like to tell you a little about each of the three men who have accompanied me here today and some of the pollution prevention projects that they have been involved with.

Carl Wheeler's company, Seaboard Metal Finishing, received a \$5,000 matching challenge grant from the Connecticut Hazardous Waste Management Service. Carl's company matched the grant with its own money and hired a consultant to look through its plating operations and suggest ways to reduce waste. Seaboard took the suggestions, applied cost/benefit analysis, and came up with changes in procedures. Among the results, Seaboard eliminated 16 tons of hazardous waste a year. And although Seaboard put \$15,000 of its own money into the changes, the payback period was only slightly more than one year.

So every year Carl Wheeler can look at his bottom line and see another \$15,000 in savings. And other Connecticut companies can learn that pollution prevention means dollars saved.

Jim DeWitt has a number of successful projects among his membership. One of these is Quality Rolling and Deburring Company in Thomaston, where atmospheric evaporators were installed on each of their five nickel plating tanks at a cost of \$5,000 per tank. By recycling the nickel, the company saves over \$2,500 a week in raw material costs. That resulted in a payback period of six months. And the environment benefitted because the new system resulted in less hazardous waste and less wasted water.

Jack Healy works for the Torrington Company, part of Ingersoll-Rand, which has worldwide operations and many thousands of employees. At the Torrington Company, about four years ago, they

initiated a chlorinated solvent reduction program. They did a number of things from telling people not to use the solvent and making sure cans were not left open, to using substitutes such as alkaline cleaners. The savings were 52,000 gallons of solvent a year, a 50 percent reduction. At 35 cents a pound, this adds up to savings of thousands of dollars a year.

As important as the dollars saved is the reduction in the use and subsequent disposal of chemicals that contribute to depletion of the ozone layer.

As these examples illustrate, pollution prevention is not a single idea or a single approach. It is a dynamic concept that requires the support of Government and the commitment of industry. Managers at the top must be made aware of its importance along with workers on the line. Changes can come from any level.

Pollution prevention equals good business, good environmentalism and good Government.

Critical to this process is that Government—regulators and non-regulators—provide support to companies that cannot do the pollution prevention job themselves. Sometimes that means being available as an information clearinghouse. Other times it means providing financial and technical support in a proactive way.

Pollution prevention should be a priority for all levels of Government and for industry. Pollution prevention works. It has proven itself again and again, and it holds a promise for a better environment for all.

I'm sure that these three gentlemen will be happy to answer any questions that you might have about the processes.

Senator LIEBERMAN. Thank you, Kathy. That was excellent testimony.

Let me pose this question to the three of you. The brief story that Kathy told about each of you is a success story both in terms of the environment and again in terms of your own businesses. This is paying back pretty quickly and pretty well.

I guess I could ask it two ways. One way is, why didn't you do it earlier? But in another way, how did you get into it? In other words, was it the technical assistance that Kathy's group gave you that opened your eyes to these possibilities, or did you think about doing it anyway but needed a little bit of help from her? I want to go through your business management system to see how you discovered this opportunity and implemented it.

Mr. WHEELER. Senator, as a small businessman, I started my involvement with the business in 1954, before regulations, at which time our company was a big polluter into the rivers. In 1961 I was responsible, as General Manager, to put the second water pollution system in Connecticut into this plant, voluntarily.

I was fortunate enough to buy my own business in 1972, and when I bought it I bought it with the understanding that we were going to have zero pollution by 1980. In 1977 as the laws became more stringent, I went to the Environmental Protection Agency and was able to get a grant for \$200,000 to upgrade my pollution system at 6% percent.

The Government supported my efforts to produce and encouraged me to stay in business. If they had not given me that money

that day, I would probably be doing something much safer than what I'm involved with now. [Laughter.]

Senator LIEBERMAN. So part of the standard was the initial understanding of what regulation was going to require of you to do?

Mr. WHEELER. I believe very strongly in strong Federal regulation to accomplish the end result.

Senator LIEBERMAN. Right. But how critical was the low interest loan? Could you have done it otherwise?

Mr. WHEELER. No, I could not have. In fact, today it would be impossible. I can't borrow money anywhere today, as a small businessman.

Senator LIEBERMAN. Right.

Mr. WHEELER. I have nothing of credible interest. I am considered an undesirable risk to banks.

Senator LIEBERMAN. Because of the general tightening of credit? Or because—

Mr. WHEELER. Because of the implementation of laws, and because of the cradle to grave responsibility of one who takes on these situations. I only have my personal resources to contribute to my family business at this time.

Senator LIEBERMAN. So how did you get together with the Hazardous Waste Management Service?

Mr. WHEELER. I believe in zero pollution.

My wife read the questions you were going to ask today on source reduction. She went running into my bottom drawer, grabbed out my electric razor—which I hate—gave it to me and she said, "Carl, this is a source reduction. Shave with your electric shaver this morning, and you won't have a stainless blade for 500 years polluting the environment."

Source reduction—I believe in it, and it will eventually be profitable. I plan to be a survivor with my three boys in this business in Connecticut, as long as Connecticut businesses believe that they are survivors in Connecticut.

Senator LIEBERMAN. Good.

Now, let me understand—could you have done that without the technical assistance that the Management Service gave you?

Mr. WHEELER. No, they've been a great help. At the Federal level and at the State—and amazingly enough, when you make regulations at whatever level, a lot of entrepreneurial good ideas come out that would not otherwise be available for companies to do source reduction.

We have alternative finishes in Connecticut that I have been tooting the horn on since 1970. We could eliminate 50 percent of all toxic chromium usage tomorrow. It's already off the shelf. Billions of pieces have been done with it, and I've presented it to Stanley works as an alternative for one of their products. I do it every day, and you use them every day. I believe that there are alternatives to this and we can prosper.

Senator LIEBERMAN. Mr. DeWitt, how about your story?

Mr. DEWITT. Senator, I wear two hats, one is the Executive Director of the Connecticut Association of Metal Finishers, and the other is the President of the Connecticut Resource Group which is an environmental consulting firm. Part of the work that we do is

working with small companies on developing hazardous material management plans.

One comment on the terminology. I just referred to hazardous material management plans, we were talking about pollution prevention programs, sometimes we hear waste minimization programs, we also hear toxic use reduction programs. They all basically mean what we're talking about here today—pollution prevention and trying to take a look at alternatives to keep pollution from happening. We're going away from the trend of pollution control versus pollution prevention.

My role with the Association goes back about 10 years and the Seaboard Metal Finishers have been a member since probably day one. I've been involved with Hazardous Waste Management Service since their formation in 1983.

The technical assistance program that came into being three or four years ago has been supported since its inception by our Association as a necessary ingredient to improving the management of waste and environmental compliance programs within industry. The technical assistance program—which is tremendous, wonderful, and should be taunted as an outstanding program throughout the Country—has really two components to it.

One is the technical assistance where somebody is on staff that a small company could call and ask questions about minimizing waste, disposing of waste, and who to contact. The second ingredient is the financial assistance program.

In the last two years, through issuance of matching challenge grants, they've gotten companies like Seaboard—smaller companies, larger companies like Torrington—to not only take a look-see at what they're doing at their plants—or encourage look-sees—but to encourage the dissemination of that information to others.

Now certainly Seaboard has been doing this for a number of years. What the grant did was prompt Carl to start sharing that information with other people and other companies with similar operations.

The role of technical assistance programs and financial assistance programs I think is critical. In answer to your question, what can the Federal Government do? I think it can support those programs.

One additional comment, our Association has recently submitted an application for a matching business outreach center grant, which is a financial assistance program offered through the Connecticut Department of Economic Development. What we're hoping to do is to develop a program of business helping business prevent pollution. That would supplement the Hazardous Waste Management Service's technical assistance program by providing in house pollution prevention opportunity assessments, a walk-through, going into a small company and being able to identify sources of waste minimization practices that could be incorporated.

And also to develop a clearing house of regulatory information to assist primarily small business within the metal finishing and manufacturing sector gain easy access to what the rules are so that they can go about complying with those rules.

I think whatever the Federal Government can do to encourage both quasi public State agencies like this Service, as well as busi-

nesses themselves, to encourage outreach programs, I think that's an asset to the people of the State of Connecticut.

Senator LIEBERMAN. Thank you. I think that was a very helpful testimony, and also directed to what we can do. But we've had some battles just in the year that I've been in Washington, D.C., and I guess that it's gone on for some period of time with the Administration, over the funding for some of those programs. To me they are just extremely cost effective. They're the best of what a lot of us talk about, which is a public private partnership to achieve societal goals—in this case environmental protection and maybe even better economies for your companies.

So I thank you for what you've said and what you've done.

Mr. Healy, again, the Torrington Company is a big company, and affiliated—unlike Mr. Wheeler and some of the others that Mr. DeWitt represents—affiliated with a larger national operation. How important was the assistance that you got from the Hazardous Waste Management Service?

Mr. HEALY. In our case, I don't think that the direct assistance on the process we're working on was a lot of help because we were already started on this and we have a corporate environmental consulting group that we draw upon. But the general guidance and the information that we get from them in a general nature is very helpful.

I also wear two hats. I also get a grant to run a course at Waterbury State Tech. It's the first time that it's been run. It's a waste minimization course and most of the people in that course are from small businesses or from the Connecticut Department of Environmental Protection. They fund that course. In the first term we had 42 students who signed up for it.

Senator LIEBERMAN. Did they all pass?

Mr. HEALY. So far they all passed.

The Torrington Company, again, we got started in this about four years ago, but before that we were minimizing waste in a recycling application. In 1985 we decided to get involved with waste minimization of solvents. We selected solvents because they were particularly troublesome for us to handle. Solvents seem to pervade the work place. If you have a solvent that's used for one operation, it's very useful for other machine operations and cleaning, so people like to take it in little cans and disperse it around the facility.

We had one particular facility where we were having problems and we were going through lagoon closures and we kept having solvent in them. So it was decided that we would just eliminate the solvents in the plant. We would just put money into the facility, buy new technology, and eliminate the use of chlorinated solvents.

About the same time all the information started coming forth about the ozone layer and the Montreal protocol was implemented. So we've looked pretty good in our company, our group looked very good because we've gotten a little bit ahead of our goals.

We hope—these figures that I gave you were for 1989—we hope that by the end of this year we will have eliminated another 50 to 75 percent. We have two more plants that will be completely eliminated of the use of solvents, so by the end of this year we should be below 20,000 gallons a year as far as the use of solvents.

Ms. GOLAS. Can I say something here?

Senator LIEBERMAN. Certainly.

Ms. GOLAS. I'd like to mention that the course that Jack mentioned that he is teaching is a direct result of a Federal grant that we did receive. We were one of 14 States that received the grant. We were also one of six who received another Federal grant to identify innovative technologies in the State of Connecticut. So the money has really assisted our program.

Senator LIEBERMAN. I appreciate the testimony.

I'm going to thank all of you for being here. It's been a very interesting morning for me in several ways. I certainly conclude that pollution prevention is a theme and a policy that should be the banner that carries us forward now into the next decade and on into the next century. It should appropriately be combined with law and enforcement.

But hopefully we're creating an ethic here that will lead to a need for less enforcement and more voluntary cooperation because of society's understanding that what we've been doing for the last several decades is not good for us. It may have seemed easy or cheaper at the time, but it's not good for us. I'm really quite struck. I guess I would say that there's more going on here than I would have appreciated myself. I'm impressed by that and I'm grateful for the people that are represented here now, and by the others that are involved, but particularly by this group. I think it's a reflection.

What strikes me about it is that, in one way or another, each of you have said that you want to be good citizens, it's not bad for your business—it's either good or neutral. And even in a more direct way, you feel that the public, who are your customers, really want you to do this. In that general sense, you're responding.

To me it's fascinating. You're responding to some forces that are not immediately market forces in the traditional sense, and yet I think you've all reached the judgment that you don't want to be labeled as a "polluter" and you don't want to be a polluter for your own self-respect. Therefore you're going to try to do what you can to prevent it.

I admire that, and I'll take that message back as we begin to make a blend of what we can do in Washington, D.C. to help encourage this process without trying to control it or, in a sense, get in the way.

I also find a couple of things—we're going to leave the record open for questions and any other testimony that anybody would like to submit. I appreciate the time here.

I do want to thank Mark Mahoney. Mark is a fellow with me from the Environmental Protection Agency, the regional office in Boston, and he's spending—how many months?

Mr. MAHONEY. Until August.

Senator LIEBERMAN [continuing]. Until August with me. I do want to also take the liberty, on the record here of this official document of the United States Senate, of thanking Jeff Benson.

Jeff came to me about two years ago in the spring of 1988, just getting out of college, with this strange and perverse desire to get involved in a political campaign. He has seen me through that. If

anybody asks you how I won, this is the rose. And many people still do ask that question.

He has stuck with me now through this first year and a quarter as an assistant in the office here in Hartford. He's just a superb individual and has helped me immeasurably in the first year to be of service to the people of Connecticut.

I say this because this is his last week with me. For the record, he's leaving to go on to law school—graduate school. I just think that he's going to be great at whatever he does. And I know that he carries environmental sensitivities with him. I would guess that he will be a pollution preventer of the first rank in his own right. I'm glad to be able to enter that on the record.

I thank all of you for being here today. I hope that the hearing has been as interesting—and may I say—encouraging to you as it has been for me.

Thank you all. This will now conclude the hearing.

[Whereupon, at 12:45 p.m., the subcommittee was adjourned, to reconvene at the call of the Chair.]

[Statements submitted for the record follow:]

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TESTIMONY OF
JULIE BELAGA
REGIONAL ADMINISTRATOR
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION I
BEFORE THE
SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION
OF THE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
U.S. SENATE

HARTFORD, CONNECTICUT

April 9, 1990

My name is Julie Belaga, Regional Administrator of the U.S. Environmental Protection Agency's New England Regional Office. My comments on pollution prevention will focus primarily on activities in the six New England States which make up EPA Region I.

As you know, pollution prevention is one of the Administration's and EPA's key environmental themes and one which I intend to emphasize in Region I. As one of our top priorities, pollution prevention is an indispensable tool for making environmental progress in the 1990's. The primary goal of pollution prevention is avoiding the generation of wastes and pollutants through source reduction, followed by environmentally-sound recycling.

To build the ethic of preventing pollution into every aspect of human endeavor that has the potential to create pollution, we will need to effect a profound cultural change. This cultural change, which requires an evolution in attitudes toward prevention as well as systems and technology changes, must happen not only in large corporations and government institutions, but in the

individual and community as well. Regulations and economic incentives alone will not accomplish this fundamental change of mindset; education, outreach and technical assistance are equally important. However, incentives and regulations may be necessary in breaking down any institutional barriers which persist in inhibiting efforts to make the goal of preventing pollution part of every decision-making process.

THE OPPORTUNITY FOR POLLUTION PREVENTION

Pollution prevention represents a fundamental shift in EPA's approach to avoiding environmental contamination and degradation, protecting human health, and conserving natural resources. Whereas traditional pollution treatment and control methods attempt to stop already existing pollutants from reaching the environment, pollution prevention aims to anticipate and avoid the generation of pollutants. This move "up the pipe" is motivated by EPA's recognition that even quite sophisticated treatment and control methods have not succeeded in preventing some very significant environmental problems from developing. Moreover, in the face of the continual (often inadvertent) creation of new pollutants and discovery of complex environmental interrelationships, treatment and control methods hold even less promise of single-handedly averting future problems.

Pollution prevention consists of two basic types of activities: source reduction and environmentally-sound recycling. Source reduction is the preferred method of pollution prevention. It entails re-analyzing and manipulating systems and products that

produce pollution so as to eliminate or minimize pollution. In the manufacturing realm, for instance, source reduction may involve reducing demand for polluting products, changing the nature of products so that they do not contain pollutants or themselves pollute, reducing pollutants involved in the manufacturing process, or minimizing waste in systems that use pollutants.

Reuse of a material involves either using it over again in the same process or for the same purpose, or substituting it for a raw material in another process or for another purpose. A typical example of within-process solvent reuse in the New England electronics industry is provided by Polaroid's Toxic Use and Waste Reduction Program. Prior to 1988, most of the liquid freon Polaroid used to degrease electronic circuit boards for cameras was released to the air. New degreasers, which cool freon vapors and return them through closed-loop recycling to a reusable liquid state, have greatly reduced disposal and virgin freon costs, as well as air emissions of freon.

Although recycling is more preventive than treatment and control, because it can reduce the release of pollutants to the environment and reduce the use of raw materials and natural resources in production processes, it is less preventive than source reduction in that it does not directly reduce the generation of pollutants in the first place. Therefore, EPA ranks environmentally-sound recycling below source reduction in the pollution prevention hierarchy.

Reclamation entails extracting valuable materials from waste

materials, which can yield potential pollutants in the form of residuals or by-products; recognizing this, EPA endorses only "environmentally-sound" recycling as pollution prevention. Automatic Plating Company of Bridgeport, Connecticut installed an electrodialysis reversal system which succeeds in reclaiming 85 percent of the nickel previously lost in rinsewater.

Treatment and control methods are not classified as pollution prevention because they do not attempt to directly restrain the creation of pollutants. Once created, pollutants can become pollution in spite of stringent controls, often through transfer across environmental media. Nevertheless, because it will probably never be possible to entirely avoid creating pollutants, treatment and control will continue to be necessary complements to pollution prevention techniques.

EPA's definition of pollution prevention is more comprehensive than another EPA term, "waste minimization". The term waste minimization traditionally has been reserved for solid and hazardous waste; the definition of pollution prevention explicitly broadens the universe of potential pollutants beyond these bounds. Finally, pollution prevention emphasizes the multiple paths pollutants can take to contaminate more than one environmental medium. This more comprehensive definition draws attention to the possibility that pollutants prevented from contaminating one environmental medium (air, water or land) can end up in another medium if the environment is not considered as a whole.

With regard to municipal solid waste, the Agency's Agenda for Action, issued in February 1989, established a hierarchy for the management of municipal solid waste which gives preference to source reduction and recycling over incineration and landfilling. In addition, the Agenda set a national goal to reduce the amount of municipal waste requiring disposal by 25% through source reduction and recycling.

Pollution prevention holds both expected and unexpected benefits. Pollution prevention's emphasis on source reduction and cross-media effects have an important capacity in combination: they extend the power of pollution prevention beyond the ability to deal with known pollutants and expected environmental effects to the potential to avoid creating unknown pollutants and unanticipated effects. As many businesses and industries have already found, instituting pollution prevention measures can also result in both anticipated and unanticipated cost savings. These savings can take the form of reduced expenditures for raw materials, energy used in production, disposal of waste, pollution control technology, insurance premiums, and so forth. For example, the Robbins Company, a medium-sized jewelry plating company in Attleboro, Massachusetts, uses three types of systems to recover hazardous waste and precious metals from its recirculating rinsewater, yielding yearly savings of \$16,000 in water conservation, \$20,000 in avoided sewer costs, and \$25,000 in recovered metal. These improvements also allowed Robbins to avoid spending \$500,000 to upgrade its wastewater treatment plant, as well as the estimated

\$120,000 per year (including sludge disposal costs) it would have cost to run the new plant. Similar types of cost savings can be obtained in non-industrial sectors.

To fulfil its potential for preserving environmental quality, human health and natural resources, pollution prevention must be practiced not only by industry and manufacturing but also by private and public business (including agriculture, transportation, energy generators, hospitals and schools), government (at all levels), communities and individuals. EPA will work together with State and local government to encourage pollution prevention in each of these sectors. Moreover, regulation and incentive schemes alone cannot accomplish the complex systems and profound attitude changes called for by pollution prevention. Therefore, EPA is promoting "cultural change" on all levels--national, regional, sector-specific, and individual--aimed at integrating pollution prevention thinking into every aspect of society. Education, outreach and technology transfer are EPA's primary tools in advancing this cultural change.

REGION I'S POLLUTION PREVENTION PROGRAM

A great deal of work is going on at EPA Headquarters and in the Regions and States to put flesh on the bones of the pollution prevention concept. As with any new or evolving approach, the appropriate roles of the participants are not yet well defined. Federal, State and local government, as well as industry and the public, are all elements of the pollution prevention partnership.

EPA's Role

In pursuing a pollution prevention approach, EPA has a number of tools at its disposal for working with the States and others. EPA will supply information, technical assistance, and research results whenever these can help polluters reduce wastes. EPA hopes to supplement these measures by creating incentives and disincentives to ensure that environmental and natural resource costs are internalized into decision making. And, where severe institutional or economic barriers to prevention remain, or where significant threats to human health or the environment persist, regulations to force reductions in pollution generation will not be ruled out. In short, EPA intends to employ the most effective mix of activities to strike a balance between voluntary and regulatory approaches to pollution prevention.

EPA recognizes its role in promoting and maintaining the momentum building in other sectors of society. In particular, EPA believes that a strong Federal/State partnership will help reshape American thinking and develop within society a pollution prevention culture.

Regulatory Programs

Region I is currently administering and assisting with a variety of prevention-oriented programs in the New England States. For example, Region I has approved State implementation plans under the Clean Air Act for Connecticut, Massachusetts, Rhode Island, and Maine. These reduce the volatility of gasoline during the summertime ozone season, thereby preventing emissions of ground

level ozone precursors. Several other ongoing regulatory actions to address either ozone precursor or carbon monoxide emissions to the atmosphere are preventive in nature. These include Federal approval of inspection and maintenance programs to prevent excess pollution from mobile sources (New England has programs in Connecticut, Massachusetts, and New Hampshire), and regulations for all New England States prescribing Reasonably Available Control Technology (RACT) for 29 coating sources (such as fabric or paper coaters) which call for a degree of control that is usually achieved by the substitution of water-based coatings in place of solvents.

There are several prevention-oriented Federal groundwater protection programs. One seeks to prevent ground water from becoming contaminated by agricultural chemicals. Another is EPA's wellhead protection program for ground-water resources, established under Section 1428 of the Safe Drinking Water Act. The goal of this program is the prevention rather than the treatment of water supply contamination from landfills, abandoned waste sites, on-site waste handling and disposal, underground storage tanks, septic systems, road salt, and agricultural practices. To accomplish this, EPA Region I provides technical assistance to States in developing and administering their ground-water management programs and in enforcing their Underground Injection Control programs. Connecticut and Rhode Island are the first States in the nation to have approved programs; EPA Region I expects that the remaining Region I States will have approved plans by the end of fiscal year

90. EPA Region I also authorizes and administers the State grants that fund these efforts, which total about \$150,000 per State per year.

EPA Region I is also working successfully with several States in Region I--Massachusetts, Maine, Vermont and Rhode Island--through Clean Water Act nonpoint source management grants to develop plans to prevent pollution of surface and ground water. Massachusetts' Cape Cod Commission is at the forefront of this effort, having recently passed a referendum requiring that all areas critical to protecting the Cape's sole source of drinking water, the Cape Cod aquifer, be designated within six months. Based on these results and on technical tools developed by the Waquoit Bay project (a joint effort of EPA Region I, the National Science Foundation, the National Oceanographic and Atmospheric Administration, and a consortium of universities), the Cape Cod Commission will design a means of regulating new development that intervenes prior to siting and permit issuance.

Grant Programs

The Administrator's and Agency's commitment to furthering pollution prevention is apparent in the number and size of its grant programs. It is our intent that innovative State programs can act as advocates of and models for multi-media pollution prevention. EPA's grant programs with significant pollution prevention components are as follows: (1) Pollution Prevention Incentives for States Grants, (2) RCRA Integrated Training and Technical Assistance (RITTA) Grants, (3) Waste Reduction Innovative

Technologies Evaluation Program (WRITE) Grants, (4) Solid Waste Program Grants, and (5) Hazardous Waste Program Grants.

To date, under the Pollution Prevention Incentives for States Grants program, EPA has awarded approximately \$11 million to States to conduct demonstration projects, offer technical assistance, and establish ongoing pollution prevention programs. In the first round, EPA Region I had three winners. The Massachusetts Department of Environmental Management received \$280,000 to fund a three-year program encompassing outreach, technical assistance, and multi-media inspector training activities focused on the major Massachusetts industries: electroplaters, metal finishers, and machine tool and electronics manufacturers. EPA awarded the Rhode Island Department of Environmental Management \$300,000 for a three-year technical assistance program, including training, in-plant auditing, case studies, and establishing an industry-specific technical assistance database, all tailored to the metal plating, manufacturing and degreasing industry. Finally, the New England Waste Management Officials Organization (NEWMOA) received \$300,000 for a three-year program to establish a regional technical assistance clearinghouse, provide training to State inspectors and industry, and develop source reduction options for users and generators of toxic metals. Two other Region I interstate organizations, the Northeast States for Coordinated Air Use Management (NESCNUM) and the New England Interstate Water Pollution Control Commission (NEIWPC), are participating in this project which illustrates the cross-media emphasis of these Pollution

Prevention Incentives for States grants.

In the summer of 1988, EPA awarded . . . million in RITTA funds to 14 States (10 awards). RITTA grants are intended to support training programs in hazardous waste management and pilot technical assistance projects for the industrial community focusing on waste minimization. In New England, EPA awarded the Connecticut Hazardous Waste Management Service and the Connecticut Department of Environmental Protection a grant of \$320,000 over three years. The grant is being used to develop a comprehensive training and technical assistance program to minimize hazardous waste through matching challenge grants to volunteer facilities within the metal finishing industries, on-site visits and manuals for waste self-audits, annual technology transfer conferences, and annual quantification of the amount of waste reduced.

In addition to the above grants awarded by EPA headquarters, the Pollution Prevention Branch of EPA's Risk Reduction Engineering Laboratory in Cincinnati awards WRITE grants to States to develop pollution prevention technologies. Within Region I, the Connecticut Hazardous Waste Management Service received a three-year, \$300,000 grant beginning in fiscal year 1989 to develop and evaluate engineering and economic assessment techniques to identify source reduction and recycling opportunities for hazardous waste. The Connecticut Hazardous Waste Management Service will identify at least five techniques for evaluation during this three-year project, which concludes in September, 1991.

EPA's remaining pollution prevention grant programs are

administered by its solid and hazardous waste offices. The Northeast Recycling Council (NERC), a committee of the Council of State Governments, has as its primary focus the development and stimulation of markets for recyclables. NERC received a \$48,000 solid waste management program award in fiscal year '89 from Region I for designing an economic development strategy for promoting recycled materials markets in the Northeast. NERC's second market development grant is a fiscal year 90 national solid waste competition award of \$78,487 to promote cooperative regional action on recycled materials market development. Specific recommendations will be made to EPA and States on actions to improve regional markets.

Among other solid waste program grants, Region I also awarded \$10,000 under a fiscal year '89 cooperative agreement with the Rhode Island Department of Environmental Management (DEM) for a peer match/outreach program in recycling. Rhode Island DEM recycling staff present workshops, seminars and on-site consultations to municipalities in Region I, and prepare and distribute reports and training materials.

The Coalition of Northeastern Governors' (CONEG) Northeast Source Reduction Council received funding from many sources, including a grant from EPA in FY '89. CONEG focuses on consumer products packaging, and is composed of State officials, business and industry representatives, and nonprofit groups from nine Northeast States. The goal of the Source Reduction Council is twofold: (1) to provide a publicly credible and accountable basis

for industry to undertake a voluntary and continuing process of source reduction through modifications of product design, packaging distribution, and retailing of consumer products; and (2) to provide a forum and deliberative process that will enable the nine CONEG States, working with business and public interest organizations, to devise and design guidelines for packaging, distribution and retailing of consumer products which are compatible among and between the nine States, in recognition of the interstate character of the market economy associated with these functions. The Council has developed the following preferred packaging hierarchy: (1) no packaging; (2) minimal packaging; (3) consumable, returnable or refillable/reusable packaging; and (4) recyclable packaging or recycled material in packaging. In addition, CONEG has developed model legislation to limit toxic constituents in packaging and is developing guidelines on preferred packaging.

The New England Pollution Prevention Council

The New England Pollution Prevention Council is an example of an outreach effort directed at accomplishing cultural change toward pollution prevention in Region I. The Council is a public-private group composed of twenty leaders in government, business, academia, industry and environmental groups. EPA Region I initiated the formation of the Council by extending invitations to leaders with a known interest in environmental issues, who could collectively represent a wide variety of viewpoints and geographic areas within New England and act as role models within their

constituencies.

The mission of the Council is to: raise public awareness of pollution prevention as a new strategy for preserving environmental quality; examine incentives and barriers in implementing the pollution prevention strategy in industry, business, municipalities and homes in New England; and, work to promote these incentives and overcome these barriers through members' professional and personal influence and well as through designing and carrying out specific pollution prevention projects. In short, the Council is committed to raising the discussion of pollution prevention to a higher level and disseminating the message to all sectors. The Council is co-chaired by me, as EPA Region I Regional Administrator, and John Gould, President of Associated Industries of Massachusetts, and has met since November 1989.

EPA Region I Pollution Prevention Strategy

To begin to integrate prevention into our policies and activities, EPA Region I has published an in-house pollution prevention strategy for fiscal year '90. Region I distributed the Strategy to the New England States and other interest groups for comment. The Strategy describes both program changes and special projects that EPA Region I is undertaking to integrate the pollution prevention ethic into our institutional thinking and action. Many of the pollution prevention initiatives in the Region I Strategy address New England environmental problems of high risk to human health and ecosystems.

Here follow a few examples of the initiatives contained in

the Region I Strategy. Region I will: (1) incorporate pollution prevention into our goal setting, planning and budgeting processes; (2) minimize the amount of chemicals needed to analyze samples and the volume of waste generated by testing at our Regional laboratory; (3) pursue advance identification and protection of critical wetland habitat in permitting under section 404(c) of the Clean Water Act; (4) undertake a multi-media project which uses computer mapping techniques to map pollution sources and affected or potentially affected sites/resources, to help target these areas of environmental concern for preventative or corrective measures; (5) strengthen mobile source enforcement to reduce tampering with automobile emission controls, increase summertime gasoline volatility compliance, and prevent improper disposal of related wastes such as antifreeze and motor oil; and (6) work with the States of New Hampshire and Massachusetts to develop a comprehensive management strategy for the Merrimack River watershed, including measures to prevent municipal pollution and encourage source reduction in the electroplating industries located there. Beyond these examples, EPA Region I's pollution prevention strategy contains a host of other program changes and special projects too numerous to be listed here.

EPA Region I's Pollution Prevention Task Force shaped the development of the Strategy. Made up of representatives from our pollution prevention program staff, each of our Divisions and Offices, and New England interstate associations, the Task Force is Region I's agent for institutional change. Its current

activities include helping to promote an in-house pollution prevention ethic, identifying multi-media prevention opportunities in our activities, selecting special projects for contract funding, and educating fellow employees about pollution prevention.

EPA Region I's in-house recycling program predates the Strategy, but was targeted in the Strategy for further development. Region I now recycles paper and other materials, promotes double-sided copying, and revised circulation procedures to substantially cut down on copying. In the first year of operating with our new copying policies, EPA Region I realized a savings of about \$40,000 in printing expenses. We are now procuring stationery made from recycled paper and are encouraging the General Services Administration to provide supplies made with increased recycled content.

EPA Region I's Earth Day 1990 campaign was featured in the Strategy as an example of our increased involvement in public education and outreach. The theme of our Earth Day campaign is called "Save It," and is intended to publicize the pollution prevention ethic. The "Save It" campaign aims at motivating and educating individuals to make environmentally-friendly lifestyle changes at home, in the workplace, and in their purchasing habits. Region I's Earth Day campaign includes outreach to the schools, in the form of staff speakers, "Save It" lessons including home audit kits, computer games, and an environmental essay contest focusing on the roles of individuals and communities in solving environmental problems.

The State Role

As noted earlier in my testimony, our success in pollution prevention hinges on building effective partnerships with the States, industry, and the public. Because State organizations have closer, more direct contact with their citizens and are often more aware of their needs and problems, they can play a vital role in helping to tailor pollution prevention solutions to the needs of individual manufacturers, communities, institutions, farmers, and others. To date, the States have been at the forefront of the pollution prevention movement; this is impressively illustrated in Region I.

The Solid Waste Problem In Connecticut

Connecticut's burgeoning solid waste disposal problem is an example of a problem in which pollution prevention and recycling techniques need to play a major role and is an issue that will require cooperation between State, Federal and local government, the public, business and industry to solve. The Connecticut Department of Environmental Protection's (DEP) proposed "State Solid Waste Plan" projects that the State's municipal solid waste stream will grow from the 1988 level of about 8,100 tons per day to about 10,160 tons per day in 2010, assuming a constant per capita rate of waste generation.

Today, Connecticut's solid waste goes to 74 landfills, 45 transfer stations, two municipal incinerators, five resource recovery facilities and one mechanized regional recycling center. Costs associated with waste management are high and increasing. At

landfills, the average tipping fee in 1986 was \$20 per ton; current fees average about \$70 per ton. The tipping fee at the Windham Energy Recovery Facility, a municipal incinerator, was \$83 per ton in 1988. For resource recovery facilities, fees are about \$60 per ton.

Proposed source reduction measures and recycling activities would handle about 37 percent of this stream, amounting to about 3,760 tons. Less than 10 percent of the wastes considered by Connecticut to be recyclable are currently recycled, but future capture rates for these items could range from 55 percent to 75 percent, with the State's goal set at about 25 percent. Disposal to the remaining landfills and small incinerators would manage about four percent or 400 tons of the total solid waste stream, leaving about 6,000 tons for disposal at waste-to-energy facilities. Since the State can be certain only of its five operating waste-to-energy facilities and one under construction, it is able to project capacity for only about 4,700 tons of this amount, leaving the remaining 1,300 tons for additional facilities or alternative disposal options yet to be planned. The future "excess" waste burden will probably exceed 1,300 tons, in the form of waste from landfills scheduled to close over the five-year period and early landfill closures which are likely to follow promulgation of new Federal landfill criteria.

A crisis appears to be imminent. In response, Connecticut has updated its solid waste management plan and incorporated changes compatible with EPA's proposed criteria for municipal solid

waste landfills. These timely revisions should make it easier for the State to apply for and receive early solid waste program approval, giving Connecticut a fighting chance to avert its impending solid waste crisis.

.State Legislation

State legislation promoting pollution prevention goals has proliferated recently in Region I. Legislation regulating special wastes and hard-to-dispose-of materials has been enacted in most New England States.

One of the successful legislative proposals the Connecticut DEP submitted to the 1989 General Assembly, Public Act 89-385, aims to reduce packaging and disposable products and enables the DEP to revise its Solid Waste Management Plan to include a source reduction component. Among its provisions, the Act: allocates \$1 million for public education on waste reduction and for developing markets for recovered materials; requires stores which offer plastic bags at checkout to also offer paper bags and inform customers that they have a choice; mandates labels describing the recyclability and toxicity of products; sets minimum standards for recycled content and allowable volume or weight of packaging; establishes a \$1 per ton solid waste disposal fee on mixed waste going to landfills or resource recovery plants; and makes recycling of nickel-cadmium household batteries mandatory after July 1, 1993.

Another Connecticut law passed in 1989 will ban sale of polystyrene foam products manufactured with CFC-11, CFC-12, CFC-113, CFC-114 and CFC-115 by 1992.

Massachusetts' Toxics Use Reduction Act was enacted in 1989. The Act establishes a statewide goal of reducing toxic waste generation by 50 percent by the year 1997. This Act establishes toxics use reduction as the preferred means for achieving compliance with any Federal or State law or regulation pertaining to toxics production and use, hazardous waste, industrial hygiene, worker safety, preventing public exposure to toxics and releases of toxics into the environment, and for minimizing the risks associated with the use of toxic or hazardous substances or wastes.

Other States in the Region have also been in the forefront of the pollution prevention issue. In Rhode Island, the Ocean State Cleanup and Recycling (OSCAR) Program produced a comprehensive manual on how to set up and run a profitable recycling program for commercial waste producers. In 1989, commercial recycling regulations took effect. By statute, Rhode Island disposal facilities now cannot accept wastes containing more than 30 percent recyclable materials by weight. Since July, 1989, all lead acid batteries in Rhode Island must be recycled. By 1992, containers must be recycled at a 50 percent rate and design components that make beverage containers less recyclable must be eliminated. Rhode Island currently has one of the premiere municipal recycling programs in the country.

In Maine, an advance disposal fee of \$15 will be assessed at the retail point of sale to offset disposal costs of "white" goods (appliances). The State extended its Beverage Container Deposit law to wine bottles and juice containers of one gallon or less in

1989. The Maine law will also ban aseptic containers (i.e., "juice boxes") which are made from a composite of plastic, aluminum, and paper. Fees on tires to help offset the costs of disposal were established during 1989.

In Vermont, the State's 1989 Solid Waste Management Program calls for legislation that will encourage the return of tires to dealers for proper disposal, and further plans to explore State use of rubberized asphalt, operation of a mobile tire shredder, and other options.

The Local Government Role

The many successful local pollution prevention initiatives in Region I provide further evidence that EPA should continue to work with State and local governments to make pollution prevention a reality for individual municipalities, companies, and members of the public.

Examples of pollution prevention activities in Connecticut abound. For instance, East Lyme is Connecticut's first town to reach the State's goal of 25 percent reclamation of the waste stream through recycling. The town of North Stonington earned \$20,000 from recycling in 1987 and 1988. Greenwich saved \$900,000 (net) in sludge incineration and leaf disposal costs over 1987 to 1988 through its co-composting program for sludge, leaves and wood chips. Groton saved \$127,580 (gross) in landfill disposal costs by recycling 4,092 tons of paper and 2,287 tons of bottles and cans between 1986 and 1988. Glastonbury earned \$22,250 (gross) in 1985 by selling 1,950 tons of recycled materials.

In Massachusetts, Wellesley operates a multi-purpose recycling center which benefits townspeople, the town and the public schools. Eighty-three percent of residents in this town of 27,000 take their refuse to the recycling center.

In New Hampshire, the Town of Wilton operates a mandatory material separation drop-off center for all household wastes, disposing of them in an integrated program of recycling, incinerating, landfilling and composting. In 1986, Wilton and five participating towns in the surrounding area sold \$26,000 worth of recycled materials.

The Association of Vermont Recyclers has produced a model curriculum for grades K-12 on all aspects of solid waste. Sure to be as widely quoted and well regarded a curriculum as the well-known "A-Way With Waste" produced by Washington State, this teacher-friendly product is already in use in some State schools.

The Industry Role

In some cases working independently, and in others with technical assistance from State or Federal government, industries are also leading the way in pollution prevention in Region I. We have already discussed the innovations of Polaroid and Robbins, but others are being tried by industries in every State in Region I. Here are just three further examples:

After exploring numerous technologies for reducing the waste generated by its barrel nickel plating operation, Automatic Plating Company of Bridgeport, Connecticut selected an electro dialysis reversal system (EDR)--a move that has saved the company about

\$129,000 annually. The \$120,000 investment for the EDR system had a payback period of only 1.4 years and the system has run trouble free with continued product quality. The EDR system recovers nickel salts from plating rinse waters, returning them to the nickel plating baths prior to entry into the waste treatment system. The new technology has helped the company recover 85 percent of the nickel contained in the plating rinses. Precision Metal Finishing Company of Connecticut, a nickel plating operation, installed an electrolytic recovery unit with a payback period of less than one year. The company anticipates that the recovery unit will eliminate the generation and off-site disposal of metal hydroxide sludge, saving the company \$17,000 each year.

Reliable Electroplating in Attleboro, Massachusetts stopped shipping parts from the Far East because they came covered with grease and solvents were necessary to clean the parts. Although parts produced by a local firm were much more expensive, a net savings was achieved because the local company does not coat the metal parts in grease. (Grease coating provides tarnish protection when shipping over long distances.)

CONCLUSION

Pollution prevention represents a truly profound change in our approach to solving environmental problems. Considering all environmental media (air, land, water) as a unified whole and anticipating and preventing pollution sound like simple common sense approaches, but past practice has not reflected these principles. Everyone, from individual members of the public to

heads of major corporations, has a part to play, either individually or in concert, in making pollution prevention a reality. Success stories in Region I underscore the important opportunities pollution prevention offers in realizing environmental gains.

This concludes my prepared testimony. I would be happy to address any questions you may have at this time.

Testimony of Leslie Carothers
Commissioner, Department of Environmental Protection
CONEG Packaging Reduction Initiatives
Before the Pollution Prevention Hearing of
the Senate Subcommittee on
Environmental Protection
April 9, 1990

I am pleased to have the opportunity to comment at today's hearing on pollution prevention. I will use my time to explain briefly an innovative program set in motion by the Coalition of Northeastern Governors to restrain the growth of packaging as a constituent of solid waste.

I believe that several developments in environmental protection have laid the foundation for this and other pollution prevention initiatives.

First, we should all acknowledge our achievements where they exist. The state and federal laws of the 1970's and 1980's have produced a major investment and substantial successes in imposing and enforcing so-called "end-of-pipe" treatment on sources of pollution to the water and the air. From best practicable technology (BPT) to best available technology (BAT) to lowest achievable emission rate (LAER), the acronyms of our water and air pollution laws have compelled the installation of costly and highly effective technology to control the level of pollutants entering our water and air. There is no question that our air and water are much cleaner for the effort.

We learned as we worked through these programs, however, that the end-of-pipe approach had inherent limitations. Often pollutants removed from the air ended up in the water or on the land or vice versa. We also discovered that increasing levels of control were gained at dramatically increasing costs as we worked to reduce very low concentrations of toxic pollutants. The last 5 to 10 percent has proven to be a tough nut. We have been bumping up against the limits of both technology and economics as we strive to eliminate the last increments of pollution through end-of-pipe technology.

Meanwhile, the public was awakened to the dangers of poorly regulated waste disposal by such dubious environmental landmarks as Love Canal. The public's legitimate fear of ground water pollution, drinking water contamination, and a host of environmental health hazards, real and imagined, has resulted in a near phobia on the disposal of any waste material near anybody's back yard.

And who can blame them? This country, once blessed or cursed with an endless frontier, has done a lousy job of waste disposal throughout most of its history. Who can fault the citizenry for its skepticism that industry and government are capable of building "sanitary landfills" (an oxymoron in my experience) or that waste incinerators will truly live up to their billings as safe and dependable means of disposal.

The last point that I think is important in understanding the impetus for waste and toxics use reduction is the impact of state, but most importantly, the federal Community Right-to-Know law passed in 1986 in the amended Superfund law. That law required sweeping disclosure of companies' releases to the environment of a host of loading of chemicals that remained after regulation has helped to lay the groundwork for a new look at how we are regulating pollution and especially waste and chemical pollution.

These pressures first spurred various programs to encourage or force recycling and next, a focus on how waste can be reduced at the source. If none of the disposal technologies is attractive, it is a short step to zeroing in on reduction of waste at the source. That is where we are in the northeast. Although our fellow states in the heartland may have more open land for disposal and a less militant citizenry to contend with today, I think we can expect the pressure for waste and chemical use reduction to spread throughout the country in the nineties. It will eventually compel all of us to think about how we can reverse the upward trend in per capita waste generation and will demand that industry look hard to find ways to reduce its use of materials that contribute to environmental pollution and hard-to-handle waste.

Source Reduction: Packaging

In the northeast, increasing attention is being paid to ways to reduce the solid waste stream to conserve scarce landfill capacity and to limit the need for costly and controversial waste-to-energy incinerators. Naturally, a good deal of new attention is being paid to the composition of the solid waste stream. What we see is that nearly 30% of that waste stream is packaging. According to EPA publications, the makeup of packaging waste in 1986 was about 14.5% paper, 7.6% glass, 4% plastics (the fastest growing segment), 2% steel, 1.5% wood, and less than 1% aluminum.

The word packaging has acquired bad connotations, with people envisioning cosmetics covered with plastic glitz or microwave dinners encased in seven layers of non-recyclable materials. But the fact is, much of our packaging is intended to protect or preserve a product or to make it easier and cheaper to stock or ship. Even these legitimate goals can be overdone, however. The problem is, it takes a good bit of expertise to judge just what is necessary and what is too much.

To answer these questions and to lay the foundation for a regional packaging reduction strategy, the Coalition of Northeastern Governors, through its Environment Committee, has made this problem its priority. The results of this two-year old initiative have been encouraging, if not downright amazing.

The Coalition made it clear that the goal was a regional program that would achieve results in reducing packaging waste without a proliferation of inconsistent state laws and that would seek to set standards in cooperation with consumer goods manufacturers, users, and environmental advocacy groups. So far, the effort is off to a strong start:

*Last year, the governors of the nine states in this market of 50 million people agreed to establish a Source Reduction Council to develop and direct the packaging reduction strategy. The Council is run by a board of people from the states (the majority votes), industry, and environmental groups. Anyone can be a member, paying a sliding scale of fees.

*As its first decision, the Council agreed to recommend that each participating state submit the same legislation to reduce the content of toxic constituents in packaging. Specific levels were set for cadmium, lead, mercury, and chromium. The first three are, incidentally, the more problematic metals often found in incinerator ash.

*The Council agreed to sponsor an education program geared to encouraging consumer receptivity to minimal and recyclable packaging. While we all know that marketing mavens earn their keep by dreaming up fancy wrappings to lure us consumers, we become easily accustomed to packaging of items we once bought bare. My favorite example was given by a Sears representative at the COMEG governor's conference. He pointed out that once basketballs were sold in metal bins. You just picked out the one you liked. Now they are framed in cardboard boxes and lined up on shelves. Someone obviously decided we did not want to buy basketballs that had rubbed up against other basketballs! Why? And can we break that and other bad packaging habits? Public education can certainly help.

The Packaging Standards Committee has an ambitious agenda, including these elements and more:

*Identification and quantification of the types and amounts of packaging used in established product categories.

*A procedure for applying the preferred guidelines to packaging types in order to identify opportunities for source reduction.

*A questionnaire that industry can use to evaluate their product lines according to the preferred packaging guidelines.

*Testing and refinement of the questionnaire and the guidelines with industry members of the Source Reduction Council.

*Protocol for industry and government to use -- independent of the work of the Council -- to assist with the implementation of preferred packaging guidelines and assessment of their impact.

*Establishment of definitions for source reduction, recycled content, recyclability, recycling rate, recycled material and post consumer material.

*Method for measuring source reduction in packages which in turn will facilitate the establishment of quantifiable source reduction goals.

*Establishment of quantifiable objectives for implementation timing of recycled content and recyclability for major package materials/package types.

*Recommendations for a method of measuring statewide recycling rates for packaging materials.

*Development of a Source Reduction Council position and/or guidelines on package labeling to promote source reduction, reusability, recyclability, and recycled content.

*Co-sponsorship and active participation with the Northeast Recycling Council (NERC) in a labeling summit scheduled for late spring, 1990. The purpose of the summit would be to coordinate the actions of the states and other entities to develop a unified approach to labeling.

*Development of a strategy to insure that the recommendations of the Source Reduction Council of CONEG are implemented and development of recommendations on the ongoing and long-term role of the Council.

We envision that once the quantifiable goals for packaging reduction, reuse, recyclability, and recycled content are developed, these can be adopted as standards. Common labels or symbols could be the primary means of securing adherence to the standards. Only packages that conformed would qualify for the use of the label. Controls through labeling will also reduce the potential for confusing and deceptive packaging claims akin to what we have seen in the area of health claims for foods laced with oat bran. If these approaches do not get results, more direct regulatory strategies remain an option.

The plans I have outlined were endorsed by the CONEG governors last month. The Source Reduction Council is committed to reporting results by the next CONEG meeting in the fall. Although the task is complex, the Council's progress to date gives reason for optimism that further progress will be achieved.



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TESTIMONY OF
DOUGLAS I. FOY

ON BEHALF OF
THE CONSERVATION LAW FOUNDATION

U.S. SENATE SUBCOMMITTEE OF ENVIRONMENTAL PROTECTION
APRIL 9, 1990
HARTFORD, CONNECTICUT

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First, may I thank you, Senator Lieberman, for holding these hearings on pollution prevention.

New England is presently at the forefront of creative solutions to the nation's energy dilemma and thus, of pollution prevention. CLF, working cooperatively with thirteen of our former utility company adversaries, is beginning to demonstrate that increasing the efficiency of use of our energy resources is by far the least expensive, most environmentally sound, and readily available "energy supply" available to the nation. We are demonstrating this in spades for the electricity sector, but there is no reason the same approaches cannot be applied with equal effect to direct fuel use and transportation. In my view, efficiency in our use of energy is the single most important element in any pollution prevention strategy.

Let me focus on two sectors of our nation's energy use: electricity and automobile and consider some of the opportunities before us.

I. ELECTRICITY

The New England Efficiency Explosion

A little background. In mid-1987, New England faced a public policy crisis of the first order. Our utilities claimed that our generating capacity was inadequate to meet growing electric demand, and that new capacity was needed imminently or the lights would go out. Indeed, that summer, sub-optimal performance of our large nuclear facilities, and a string of rough weather, caused the lights to dim on a few occasions.

CLF argued, however, as it had for years, that the best-term policy response was not necessarily to go out and blanket the landscape with expensive new power plants. If a fraction of the utility capital that had traditionally been spent on power supply could be diverted to investments in energy efficiency, we posited, the need for such plants would be much reduced.

With the help of the Lawrence Berkeley Laboratory and others, we documented our conclusions in a report entitled "Power to Spare." There we showed that a very aggressive program of utility investment to make our region's new buildings efficient, and to retrofit old buildings and industrial plants with high efficiency equipment, could avoid all growth in electric demand over the next two decades, even with the utilities' assumed rate of population and economic growth. And such an investment program would produce power at a third to half the cost of conventional new power supply -- putting aside its obvious environmental benefits. Unfortunately, we noted, the utilities' priorities seemed far out of line with the proper strategy: they were spending 20 to 50 times more on new generation and transmission than on less expensive energy efficiency.

We recognized, of course, that a large scale investment program had never been undertaken. But we had to start somewhere. Accordingly, CLF brought or intervened in a series of cases before four of our region's six utility commission, laying out a practical blueprint by which such a program would be carried out, and requesting the commissions to order their

jurisdictional utilities to follow this path. CLF also suggested that, to avoid ongoing polarization and dispute about what constituted proper adherence to the blueprint, the utilities be required to work with us and other public parties to design and monitor the programs.

It surprised even us when the first commission we approached agreed. In Connecticut Light & Power's 1987 rate case, the state utility regulators ruled that the company had not done nearly enough to promote energy efficiency -- particularly for new construction -- and ordered the company to double its expenditures on end use efficiency. And, in a most novel fashion, it strongly suggested that the company come back to the commission with a plan that had the support of the interveners.

The rest, as they say, is history. After the order came down, Bill Ellis, CEO of Connecticut Light & Power's parent company, agreed to what is perhaps the utility executive's version of a riverboat gamble. Bill agreed to fund the best energy efficiency program designers in the nation to work under CLF's direction but in cooperation with his company to design and field the best and most aggressive efficiency investment programs that could be created. In two months of intense but creative negotiation, we had ready to go what was at the time the most advanced efficiency programs in the nation.

Under these programs, the utility hires architects, energy analysts, industrial designers, and engineers -- at its own expense -- to come up with the best packages of high efficiency

lighting, heating, cooling, motor, building shell, and industrial process improvements -- for both new and existing buildings and homes. The utility then pays to have these efficiency improvements made -- up to the point where they are no longer less expensive than building or buying an equivalent new power supply. In most cases, the customer's financial obligation is limited to funding only the shortest-payback efficiency measures.

Note that there is a world of difference between this new approach to energy efficiency and traditional utility "conservation" programs, which consisted of thousands of "energy audits" not acted upon, public relations campaigns, and maybe a small rebate for customer-initiated equipment purchases. The hypothesis that we are testing with these new programs is that a utility will get what it pays for. If it wants to blanket its service territory with high efficiency lighting, motors, and other measures, it must take the financial and logistical burden off its customer's shoulders.

The early returns suggest that our hypothesis is correct. Connecticut Light & Power's programs for the commercial and industrial sector have been out on the street for only a year, and its program for new construction is already capturing over 30% of annual new floorspace in its territory; the retrofit program has customers standing in long queues awaiting their turn. Traditional utility efficiency programs were lucky if they hit even 10% for their intended market after 5 years. We are now entering the crucial program monitoring and refinement stage

where CLF and the company will be trying to learn from mistakes and successes and make the programs even more effective.

As documented in Attachment 1 to this testimony, the cooperative approach pioneered by CLF and Connecticut Light & Power has now been replicated throughout New England, and a typical program-by-program description is contained in Attachment 2. We are now actively involved with eight utilities which represent three-quarters of the region's power demand.

In 1990 alone -- the first year of major program activity -- those utilities will be spending about \$200 million on efficiency improvements for customers -- about four times 1988 levels. Those levels are projected to increase as fast as the market can soak up efficiency; expenditures of \$500 million annually, or about 10% of gross utility revenues, are likely two to three years from now. They may be even higher if, as I will discuss in a moment, we can make the necessary ratemaking changes to allow utilities to profit from these efficiency investments. The utilities officially expect to displace a third or more of their otherwise occurring demand growth through these programs; some tentative scenarios, however, suggest that flat or negative load growth is not out of the question -- particularly under the higher expenditure scenarios.

Implications of the New England Experience

So we have a success story here in New England that I commend to you as you ponder a national pollution prevention strategy. We are showing that large scale efficiency works. You

could do worse than to try to make national policy that would instigate similar activity elsewhere in the nation.

The obvious and immediate economic benefits of spreading the New England approach, great as they are, are overwhelmed by the environmental benefits. Take the current debates over controlling acid rain and global warming -- environmental problems for which our energy usage is largely responsible. The battle unfortunately appears to have been joined by those who believe a stable climate and clean air warrant the cost, and those who believe the price tag is too high.

Both positions miss a big point. Energy efficiency is a negative cost environmental protection strategy; environmental benefits aside, it saves far more than it costs. To take just one New England example, the Massachusetts Electric Company, with CLF's assistance, has designed a program which will in 1990 spend approximately \$37 million on energy efficiency in new buildings and plants, and retrofits. As Attachments 3 and 4 demonstrate, those 1990 investments will eliminate over a million tons of CO₂ emitted into the atmosphere. The social cost of avoiding that CO₂ varies, by program, from minus \$2.14/ton to minus \$100/ton. As Attachment 5 demonstrates, if all U.S. utilities undertook an energy efficiency program in 1990 at Massachusetts Electric's modest start-up level, we could abate approximately 220 million tons of CO₂ over the lifetime of those efficiency devices, at a comparably negative net cost. That would be a significant dent in our annual 5 billion ton CO₂ emissions rate.

By contrast, abating that same quantity of CO 2 emissions through tree-planting carries a significant positive net cost of nearly \$250 to \$1,238/tonne of CO 2 avoided. That does not mean that we should not pursue these other global warming mitigation strategies. Just that we are even more foolish if we ignore the better-than-free ones staring us right in the face.

Now, should we expect our nation's electric utilities to carry forward this effort vigorously without financial reward? A little common sense tells us that a business will not risk a tenth of its revenues on a major enterprise without some prospect of return. Accordingly, CLF has worked with New England utilities to develop a utility rate mechanism by which the companies will earn back a portion of the savings they create by pursuing energy efficiency. This approach, described generically in Attachment 6, has been adopted by the utility commissions of both Rhode Island and Massachusetts. It accomplishes two important results: first, it negates any new revenue loss between rate cases that occurs from efficiency investments. And second, it provides a direct incentive to maximize efficiency investment, by allowing the utility company a monetary slice of the savings which gets larger as the pie expands. This approach may not be right for all jurisdiction, but something like it, we believe, will be necessary to move energy efficiency from a utility side line to the center of the action.

II. THE AUTOMOBILE

The American fixation with and dependence on the automobile has negative implications for energy use and security and for almost every aspect of environmental quality: global warming; air pollution; land use; water pollution; and solid waste management. In considering the full range of externalities attributable to the automobile, it is important to consider not only the direct effects of automobile use but the environmental impacts of the infrastructure -- such as roads and gasoline production and distribution systems -- needed to support an automobile-based transportation system.

The Pervasiveness of the Auto

There are 135 million automobiles in use in the United States, twice as many as there were in the early 1960s. Americans -- only 5% of the world's population -- own 35% of the world's cars. (1)

Americans are far more likely than people in other Western countries to use the automobile for mobility. The automobile accounts for 82% of trips made in urban America; by contrast, the automobile is used for only 50% of trips in most western European countries. (2) Because we drive so much more than others, Americans actually drive about as many miles each year as the rest of the world combined. (3)

The car "problem" is not just that there are too many cars but that they are used inefficiently. Half of the automobile trips made in the U.S. carry only the driver; 87% of all trips involve no more than two passengers. (1)

Environmental Impacts-

A. Energy Use and Security

Transportation accounts for 63% of oil use in the U.S. Because of increased driving and less than adequate increases in fuel efficiency, vehicles burned 16% more oil in 1987 than in 1973. (4) Indeed, cars now account for a larger portion of oil demand than they did at the time of the 1973 oil crisis. Oil used for transportation has serious implications for energy security. In every year since 1976, U.S. oil use by the transportation sector has exceeded total domestic oil production. (1)

Automobile fuel efficiency has improved -- but not enough. The average new U.S. car is rated at 28 miles per gallon (MPG); the U.S. fleet as a whole averages about 20 MPG. (3) Although fuel efficiency for new U.S. cars doubled from 13 MPG in 1973 to 25 MPG in 1982 (5), because of low vehicle occupancy rates American cars used just as much energy for every passenger-mile of travel in 1984 as in 1971. The average American car uses twice as much gasoline each year as cars in Japan and Western

Europe, because of lower fuel efficiencies and greater driving amounts. (1)

B. Global Warming

The transportation sector is responsible for approximately one-third of U.S. carbon dioxide (CO₂) emissions, about the same as electric utilities. (4) The average American car pumps its weight in carbon into the atmosphere every year. (5)

Transportation is the energy use sector in which CO₂ emissions are increasing most rapidly. If the current rate of growth in Vehicle Miles Travelled (VMT) continues, transportation-related CO₂ emissions will increase 30% by the year 2000. As one commentator has noted "[t]here is no more profligate use of carbon in the world than the energy used to move one ton of steel each time we transport a 160 pound passenger." (6)

Carbon dioxide is one of five types of greenhouse gases. Cars and trucks are also involved in the emission and/or exacerbation of the other four (4):

- o Nitrous oxide (which also depletes stratospheric ozone) is one of the forms of nitrogen oxides emitted by cars
- o Ground level ozone is formed by the interaction of nitrogen oxides and volatile organic compounds in the presence of sunlight; the transportation sector is responsible for emissions of at least 40% of both ozone precursors
- o Methane destruction processes that naturally occur in the

atmosphere are interfered with by carbon monoxide, 70% of which is emitted by mobile sources

- o Chlorofluorocarbons (which also deplete stratospheric ozone) - are used in automobile air conditioners in 90 million cars; this use of CFC 12, one of the most potent ozone depleters, accounts for approximately 9% of all CFC use in the U.S. and over 50% of the ozone depletion potential of CFCs used in air conditioning and refrigeration applications (7)

C. Air Pollution

Nationwide, the transportation sector is responsible for a substantial percentage of emissions of five of the six conventional or "criteria" air pollutants regulated under the Clean Air Act, including:

- o 41% of nitrogen oxides emissions (NOx is both an ozone precursor and an acid rain precursor)
- o 41% of all emissions of volatile organic compounds, which are ozone precursors
- o 70% of all carbon monoxide emissions (4,8)

Cars and trucks are also responsible for a significant percentage of emissions of fine particulates and lead in the U.S. (The only pollutant for which transportation contributes an insignificant amount is sulfur dioxide; only 3% of SO2 emissions are from cars and trucks). Automobile exhaust also includes a variety of toxic air pollutants, including the carcinogen benzene.

This air pollution causes serious health problems. The National Academy of Sciences estimated in 1974 that automotive-

related pollution causes up to 4,000 deaths and 4 million sick days per year, at a cost to society of over \$4 billion. (9) University of California researchers attribute up to 30,000 deaths annually to the use of gasoline and diesel fuel. (1)

A full accounting of the air pollution caused by automobiles would have to include air emissions associated with the gasoline production and use cycle. This would include air emissions from gasoline refineries and most of the 7% of emissions of volatile organic compounds that are from oil storage and marketing. (4)

D. Land Use

Close to half of the land in a typical American city is devoted to infrastructure needed to support the automobile; the percentage for Los Angeles is two-thirds. (1) More than 60,000 square miles of the United States is devoted to automobile infrastructure; this represents 2% of the total surface area of the country and is equivalent to 10% of all arable land. (10) Indeed, there is now more U.S. land covered with pavement than devoted to housing. This land has effectively been removed from taxation and is thus unable to provide sorely needed revenue to financially strapped municipalities. (9)

We must be concerned not only about the amount of land devoted to transportation infrastructure but the types of land being used. Highway construction, particularly in suburban and rural areas, frequently destroys wetlands and displaces prime agricultural land.

E. Water Pollution

One source of water pollution associated with automobile use is stormwater run-off from highways. This run-off, particularly in northern parts of the United States, is contaminated by road salt and other chemicals used to de-ice roads. The run-off also contains substantial amounts of grease and oil; the New York Department of Environmental Conservation has estimated that one-third of the oil found in the region's waters is from highway run-off. (9) Highway run-off may also contain lead from automobiles burning leaded gasoline.

Water pollution also occurs in the fuel use cycle associated with automobile use. Oil spills from tankers carrying crude oil to gasoline refineries must be considered an externality of automobile use. The same is true for leaking storage tanks at gasoline retailers -- and it is estimated that at least 25% of the nation's 1.2 million service station gasoline tanks are leaking or will shortly begin to leak. Such leaks have already contaminated groundwater (and soil) with millions of gallons of gasoline containing hazardous substances including benzene, lead and ethylene dibromide. (11)

F. Solid Waste Management

Cars also create solid waste disposal problems. Used oil, tires and car batteries are "problem wastes" that are hazardous if disposed of improperly and difficult to recycle. Junked cars are also a problem to get rid of; if they are shredded, the

resulting "fluff" may be contaminated with PCBs from electrical equipment.

Adding Up the Externalities

I have already noted the thousands of deaths and billions of dollars in health costs caused by automotive air pollution. In addition, the National Highway Traffic Safety Administration has estimated that, in 1977, 47,000 deaths and 4 million injuries occurred as a result of automobile accidents, imposing costs of \$43 billion (not including pain and suffering). (9)

Another set of costs imposed by automobiles is lost productivity and excess gasoline usage due to congested roadways. In metropolitan Boston, for example, automobile travellers in the year 2005 will experience a total of 238 million vehicle-hours of delay and waste 253.4 million gallons of gasoline while stuck in traffic on major highways. CLF has calculated that this congestion will result in productivity losses of \$1.8 billion and wasted gasoline costs of \$250 million by 2005, for a total annual cost of over \$2 billion in the Boston area alone. (12)

Another set of costs involves the subsidies provided for automobile use in a myriad of ways: highway construction, provision of free parking on roadways and by employers, etc. By one estimate, total automobile subsidies in the U.S. may exceed \$300 billion annually. If these subsidies were reflected in retail fuel oil prices, a gallon of gasoline could cost as much as \$4.50; if they were reflected in the cost of cars, the subsidy would amount of \$2,400 per automobile. (1,10)

Even these high figures count only the direct costs of subsidies, not the full internal and external costs of operating an automobile. Brian Ketcham, a planner from New York, estimates that the full cost of operating an automobile in the United States is \$0.75/mile and that, because the ratio of external to internal costs of automobile usage is approximately 3:1, the full societal cost (including all externalities) of operating an automobile may be \$2.00/mile -- putting the potential societal cost of automobiles and their environmental impacts in the trillions of dollars. (9)

What Can Be Done

We cannot "solve" the problem of the automobile by building more roads. The Institute of Transportation Engineers recently predicted that congestion on urban freeways will increase 300% in central cities, 433% in outlying areas and 200% on the rest of the road system in the period from 1985 to 2000. At the same time, the Transportation Research Board reports that road capacity will only be increased six percent. Since the "supply" of roads will not increase enough to meet the "demand" for mobility, we must focus on ways of reducing the demand for single-passenger automobile trips.

Mass Transit and Mobility Planning

The U.S. is far behind other countries in the use of mass transit. Use of public bus and rail systems in the U.S. was no higher in 1987 than in 1979. (3) In many U.S. cities, 90% of

people commute to work by car. By contrast, in Europe only 2% of urban residents commute by automobile, while 37% use transportation and the remainder walk or bike. (1) Americans average only 28 transit trips annually per capita, far less than the 77-144 transit trips made by people in Canada and Western European countries. (2) Indeed, 15% of all trips in Canada are made by transit -- compared to only 3.4% of all trips in the U.S. -- even though population density in Canada is only two-thirds that in the U.S. (2)

A host of actions will have to be taken to remedy this situation. To get Americans out of their cars, mass transit must be made more affordable, comfortable, safe and convenient. In addition to improving and expanding existing subway and commuter rail systems, efforts should focus on creating new light rail systems and (where appropriate) expanding the limited availability of water transportation. To reduce reliance on single occupancy vehicles in areas where highways will continue to play an important role in mobility, High Occupancy Vehicle lanes (including HOV lanes on exit and entrance ramps) should be provided for buses and vanpools. Actions should also be taken to increase the number of people who bike or walk to work. Finally, regulatory restrictions on the availability of parking should be used as a "stick" to move people out of cars.

In the long run, we will only control automobile use by creating communities in which people can move around (particularly from home to work) without using automobiles. This

will require linking transportation planning with land use planning and zoning. Planners will have to create comprehensive "mobility plans" addressing a full range of issues including mass transit and land use controls.

The most aggressive mobility plan proposed to date is that for southern California. It is designed to reduce the projected number of vehicle miles travelled in the Los Angeles basin in 2010 from 150 million miles per day to only 60 million miles per day. The plan includes spending \$45 billion on building light rail, adding express bus lanes on 1200 miles of freeway and expanding van pool services. This represents, however, a savings of \$20 billion over the \$65 billion that would have to be spent to construct new freeways to accommodate current trends in VMT growth. (6) The plan could reduce carbon emissions in the region by 20%. (3)

Pricing Strategies

Pricing strategies should be used to ensure that drivers pay a higher percentage of the social costs imposed by their automobile use. In the U.S., "user fees" such as gasoline taxes financed only 69% of total highway expenditures in 1985; in western European countries, taxes on gasoline and automobile ownership far exceed government expenditures for highways. (2) At least three types of pricing strategies should be considered: raising the cost of gasoline through taxation, raising the cost of automobiles through taxes or higher registration fees, and raising the costs of driving through higher tolls and parking

fees. Revenues raised should be devoted to transportation planning and provision of non-automobile mobility alternatives.

The price of gasoline in the United States must be raised using federal and state taxes. In 1986, gasoline and motor oil accounted for only 15% of total car operating costs per mile in the U.S., down from 26% in 1975. (1) A gallon of gasoline costs less today in real terms (corrected for inflation) than it did in 1979. (3) Combined federal, state and local fuel taxes in the U.S. total only thirty cents per gallon. (13) Gasoline tax rates are three to seven times higher in European countries; the difference between the 1987 price of gasoline in the U.S. (25 cents/liter) as opposed to European countries (as high as 99 cents/liter in Denmark and Italy) is overwhelmingly due to deliberate taxation policies, not to differences in the cost of petroleum. (2)

Although concerns have been expressed that gasoline taxes are regressive, it is not at all clear that poor people spend a higher percentage of their income on gasoline than others. Wealthier households may be more likely to have one or more inefficient vehicles (such as large cars or trucks) and, more importantly, to drive more miles (and thus buy more gas). The Congressional Budget Office has determined that a gasoline tax has the same effect on all but the lowest (under \$5,000) and highest (over \$50,000) income classes. (13)

European countries also charge a higher sales tax on new cars than the U.S. American sales taxes average only 5%, while those in Europe range from 33% in France to 47% in the Netherlands to 186% in Denmark. (2) Substantially higher registration fees could also be used to increase the costs of automobile ownership.

Parking in the United States is far too cheap. Three-quarters of all commuters park in free employer-provided parking and an additional 11% park in free off-street parking spaces. As one step toward acknowledging that "free" parking spaces actually cost employers from \$166 to \$1657 (1985 \$) per space per year (2), parking should not be permitted to be treated as a tax-free employee benefit. In addition, all off-street parking (including free employee parking) should be subject to substantial local and/or state taxes.

Fuel Efficiency Standards

New car and fleet average fuel efficiencies must be increased to reduce oil use, carbon dioxide emissions and air pollution. The American Council for an Energy-Efficient Economy estimates that increasing the average fuel efficiency of new cars to 45 MPG and that of new light trucks to 35 MPG by 2000 would save 23 billion gallons of gasoline and reduce carbon emissions by 60 million metric tons. (3)

Such improvements would not be unreasonably costly. In 1982, the Office of Technology Assessment estimated that fuel efficiencies of 38-53 MPG could be realized by 1990 at a cost of

\$50-90 (1980 \$) per automobile; further improvements to 51-78 MPG could be made by 2000 at a further cost of \$120-330 (1980 \$) per car. (5)

III. CONCLUSION:

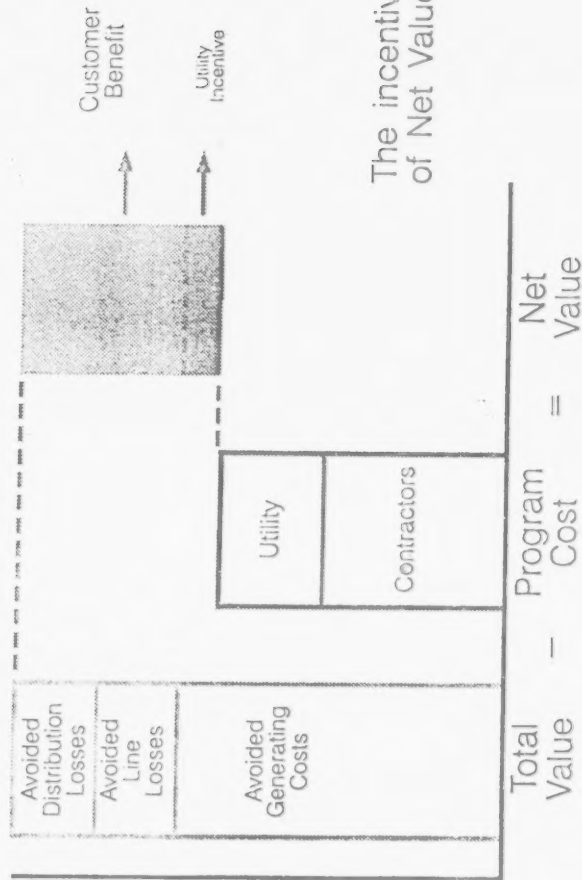
If we do nothing else about pollution prevention, we should deal with energy use and energy inefficiency. By attacking the problem of automobile use and electricity waste, we can generate enormous pollution savings through the displacement of emissions and the reduction of all manner of other environmental ills.

I commend Senator Lieberman for your thoughtful and persistent championing of these issues. Your comments of March 29th regarding S3527 are among the most enlightened I have ever seen on the automobile and its devastating impacts. I welcome the opportunity to work with you and your staff to develop comprehensive pollution prevention strategies.

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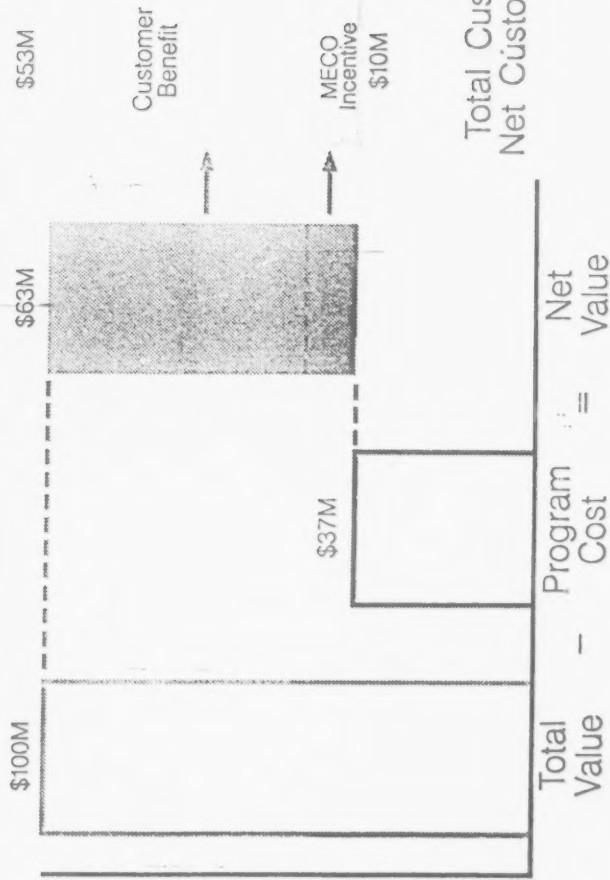
The Incentive Structure is based on the difference between the value of the conservation and the cost of the conservation.



The incentive allocates over 80% of Net Value to customers.

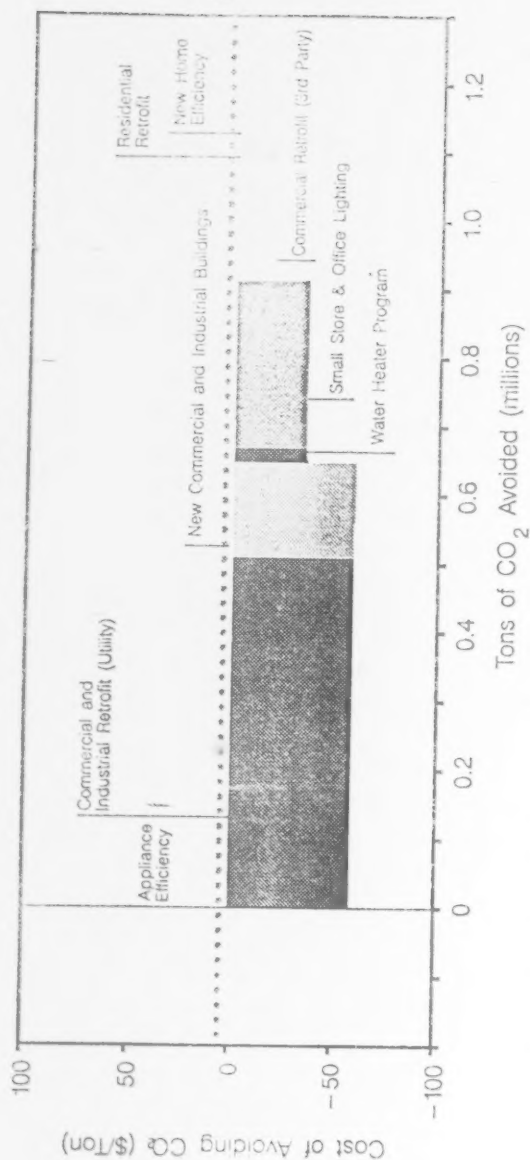
Conservation Law Foundation

If program goals are met, customer benefits will be substantial



Cost of Avoiding CO₂ through Energy Efficiency

Massachusetts Electric
Lifetime Impacts 1990 Expenditures



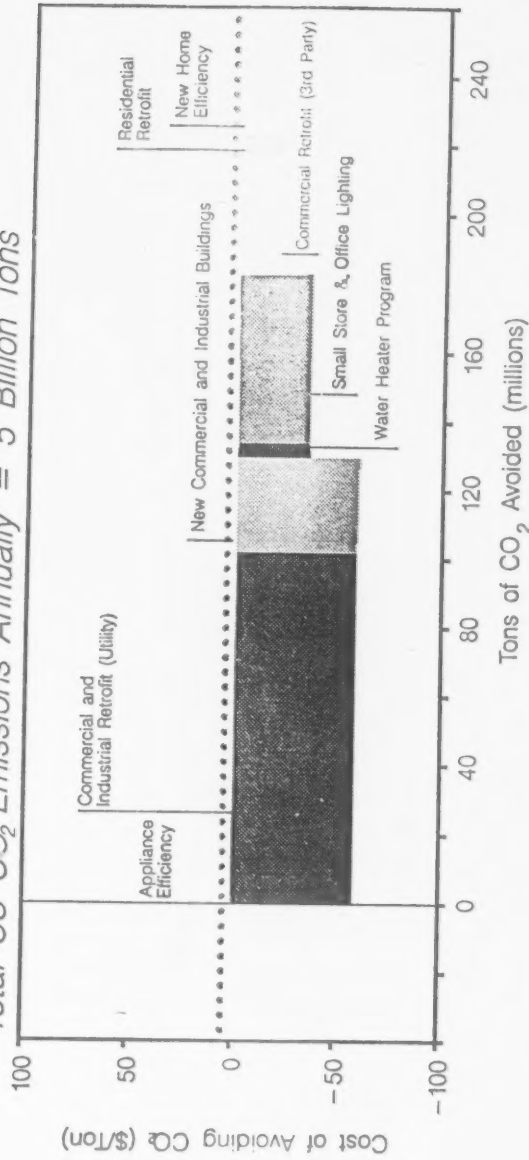
Source: Massachusetts Electric, CLF

Conservation Law Foundation

Cost of Avoiding CO₂ through Energy Efficiency

A National Strategy
Lifetime Impacts 1990 Expenditures

Total US CO₂ Emissions Annually = 5 Billion Tons



Source: Massachusetts Electric, CLF

Conservation Law Foundation

Massachusetts Electric Company 1990 Efficiency Investments

PROGRAM	BUDGET (\$000s)	CUSTOMER COSTS (\$000s)	TOTAL COSTS (\$000s)	TOTAL VALUE (\$000s)	NET LIFETIME VALUE (\$000s)	LIFETIME CO2 SAVINGS		(\$/TON)
						(MMH)	(TONS)	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Residential New Construction	176.9	37	213.9	225.2	11.3	5,285	5,285	-2.14
Energy Fitness	1,223.3		1,223.3	1,701.6	478.3	22,093	22,093	-21.65
Performance Contracting	5,339.8	1,172	6,511.8	10,670.4	4,158.6	189,595	189,595	-21.93
Small C/I	6,734.8		6,734.8	16,086.7	10,071.9	242,966	242,966	-41.45
Water Heater Rebate	339.7		339.7	1103	763.3	18,294.1	18,294.1	-41.72
Design 2000	4,714.9		4,714.9	14,006.1	9,291.2	136,900	136,900	-67.87
Energy Initiative	13,588.7	5427	19,015.7	54,408.6	35,392.9	518,923	518,923	-68.20
Appliance Efficiency	204.8		204.8	330.1	125.3	1,255.6	1,255.6	-99.79
GRAND TOTAL	32322.9	6636	38958.9	99251.7	60292.8	1135311.	1135311.	-53.11

NOTE: [6], [7]: LIFETIME SAVINGS OF INVESTMENT MADE IN 1990.

PROGRAM	NATIONAL DATA	
	LIFETIME CO2 SAVINGS (TONS)	\$/TON
	[7]	[8]
Residential New Construction	1109850	-1.78
Energy Fitness	4639530	-18.04
Performance Contracting	39814950	-18.28
Small C/I	51022860	-34.54
Water Heater Rebate	3841761	-34.77
Design 2000	28749000	-56.56
Energy Initiative	1.1E+08	-56.84
Appliance Efficiency	263676	-83.16

NOTES: [7]: Massachusetts Electric Company data multiplied by 210

[8]: Massachusetts Electric Company data divided by 1.2.



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DANA S. HANSON
EXECUTIVE DIRECTOR

Testimony of

SUSIE CRIMMINS
REGIONAL RECYCLING COORDINATOR
CAPITOL RECYCLING REGION

before

U.S. SENATE SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION
APRIL 9, 1990

My name is Susie Crimmins, I am the Recycling Coordinator for the Capitol Region Council of Governments, a regional planning and policy organization comprised of local municipal governments in the Capitol region. I provide regional coordination of recycling efforts and technical assistance to the 30 towns in the Capitol region, 4 towns in the Windham region and 8 towns in the Midstate region. In all, the region I serve has over 800,000 people in 42 communities.

Prior to working at the CRCOG, I was staff to the Municipal Solid Waste Recycling Advisory Council and the Packaging Task Force at the CT General Assembly. In addition, during the last year, I served as a member of the Newsprint Recycling Task Force at the General Assembly.

As you probably know, CT has mandated the recycling of 9 specific items by January 1, 1991. These items are as follows:

Leaves	Scrap Metal	Waste (Auto) Oil
Corrugated Cardboard	Old Newspapers	White Office paper
Lead Acid (auto) Batteries	Glass Food & Beverage Containers	Metal Food & Beverage Containers

Towns in my region are working diligently to establish collection systems for bottles and cans, newspaper and corrugated; establish composting sites and leaf collection; set-up drop-off sites for waste oil, auto batteries, and scrap metal; developing local ordinances and establishing enforcement mechanism; and developing critical public education. At a regional level we are working to establish a materials recovery facility—we call them IPC's (Intermediate Processing Centers) in CT—to sort, accumulate, process materials to market specifications, market and ship recyclable materials to the end-user markets. We anticipate an IPC of approximately 400 tons per day of recyclables. We are working to see that this facility is up and running by next January. The region has enlisted the participation of the CT Resources Recovery Authority to achieve this goal. Recently the CRRA has issued a Request for Proposal to potential vendors for various services including the design, equipment, operation and marketing of the sorted and processed materials.

From my work with the towns, I have come to the following conclusions:

Solid waste disposal is one of the most troublesome issues facing local communities. MSW disposal is often the fastest growing budget item, which is using up more and more of their limited budget resources—resources which could have otherwise been used for education, recreation, police, roads, libraries, or social services.

Municipalities are committed to establishing comprehensive recycling programs.
The level of involvement of town officials from public works departments up to chief elected officials has been very impressive and serious.

Citizens are ready and willing to cooperate by sorting their recyclables from their trash. In the towns which have established curbside collection participation rates, set out rates, and volumes collected have met or exceeded expectations. In the recently opened Springfield, Mass. MRF the first problem encountered was that far more materials than was expected were delivered to the facility the first month.

However, there are barriers to successfully fulfilling the full potential of recycling. Some of these barriers cannot be addressed at either the local or regional level, and must be addressed at the state or federal level.

Municipalities will not be able to keep up with ever increasing volumes and tonnages of municipal solid waste.

Serious attention must be given to preventing materials from becoming waste requiring disposal. This can be accomplished both through waste or source reduction and to increasing the amount of materials capable of being recycled. Even if municipalities are able to capture virtually all the mandated recyclable items, increases in the other segments or components of the waste stream will continue to cause problems.

The composition of the waste stream is changing.

As new products and packages are designed using new and more complex materials, disposal options become more and more difficult. In my lifetime, there have been many significant changes. I expect that left uncontrolled many more changes will develop. Some examples include:

The replacement of refillable glass milk bottles with single use cartons and bottles.

The replacement of aluminum cans and glass soda bottles by plastic PET bottles.

The replacement of washable cloth diapers with plastic disposable diapers.

The replacement of nearly all steel cars with cars made of substantial amounts of plastics, composites, aluminum, plastics, and other materials.

Various plastic and synthetic materials not known 30 years ago.

Each of these new items have different disposal implications than did their predecessors. Decisions as to how a product is designed has implications as to whether it can easily be recycled. Some of the 'rules of thumb' include:

The 'purer' the material, the easier to recycle, the more valuable the material.

Materials which can be recycled for the same purpose are preferable to those which cannot.

Containers made of two or more materials are more difficult to recycle.

Materials need to be separated from the waste stream before they become contaminated by other waste.

Plastic containers made of more than one type of plastic are more difficult to recycle. Uses for mixed plastics are very limited.

There is a proliferation of new and different packaging types. Separate processing and recycling systems can't be realistically set up for each new type of product or package.

Suppose there was a new package or product which looked very much like a material or product already on the market which was being successfully recycled, but was intrinsically incompatible with the recycling system in place because of the composition of the material involved. In order to recycle this material and to prevent it from causing unacceptable contamination to the recycling of the existing product, we would have to do the following:

Teach consumers to separate it from the other material or product.

Collect the material separately, maybe even needing a n additional compartment on a truck.

Process and market the materials separately.

All this would cause great problems for local recycling programs. This is not a hypothetical example. A seltzer company began test-marketing a new plastic soda can with an aluminum top. It was a more expensive package than a glass bottle or an all aluminum can. But it allowed the company to show off the 'sparkling clear' aspects of the flavored seltzer. When lying in a pile of aluminum cans, it was difficult to tell that it wasn't aluminum. Only when you held it up against the light or squeezed it would you notice that it was not an aluminum can. The problem was that just a few cans in a truck load of aluminum cans would cause the rejection of that entire load at an aluminum smelter because the plastic contributed to fires in the baghouses at the smelter. Because this new package put at risk a large-scale recycling system, the CT General Assembly passed legislation banning this can from CT. The company subsequently dropped its plans to test-market the product further. Had the product designers given any thought to what would happen to the can once it was empty, I hope that they would not have introduced it. I suspect, they idea of how will someone dispose of this can never entered into their thinking.

Another example is the proliferation of appliances with sealed in nickel cadmium rechargeable batteries. These appliances are rechargeable, but give out in a couple of years. Once thrown away they appear to be one of the larger contributors of cadmium in the MSW. Cadmium along with lead is one of those heavy metals we are concerned with when we look to establish adequate methods for disposing ash from a waste-to-energy-plant. CT passed legislation requiring that these batteries be able to be removed for separate collection by the consumer.

Successful recycling systems require successful establishment of each step in the full circle of activities called 'recycling'.

If we can easily distinguish an item, can collect it fairly economically, accumulate it, process it, market it to an end user in sufficient quantities...we can probably set up successful recycling system. But if any of these steps are too expensive or too difficult, the likelihood of establishing a good recycling system becomes limited.

The recycling symbol is circular for a reason. Each step around the circle must occur for recycling to be achieved. The part of the circle which may cause problems differs material by material and from time to time, and place to place.

Product manufacturers, consumers, generators of waste, and public officials need to learn to 'follow the garbage' and realize the impact their choices make on waste disposal.

When I visit a business looking to establish recycling, the first thing I do is take the executives to the dumpster and then try to track back where and what materials are being thrown away. Once you get a handle on what is

being discarded, why it is being discarded, from where it is being discarded, you can determine where the best place to segregate the material for separate collection.

Product manufacturers need to place greater emphasis on what happens to their product when it is discarded.

Consumers need to take into account what happens to this product versus another when it is discarded.

Source reduction is the only way to keep up with the problem.

The easiest method to dispose of waste is not to create it in the first place. Decisions to use disposable single-use items need to be made with full awareness of the impact on disposal systems.

Decisions to choose non-recyclable items over recyclable items must be made with an awareness of the impact on waste disposal.

Role of Federal Government

Establish affirmative procurement policies for products made with recycled content.
A policy to "prefer" recycled content is no policy unless it includes a price preference.

Immediately establish segregation and collection of recyclables in all federal facilities and agencies.

Establish policy that reusables shall be preferred to disposables in government procurement.

Elimination of support which gives virgin materials preferential treatment over recycled materials.

Clearinghouse for information and technical assistance.

Identification and elimination of materials which create major disposal problems (particularly toxics).

Research into the changing nature of waste stream, identification of troublesome components.

Financial support for research and development of collection and recycling systems.

Support of state efforts in establishing meaningful standards and definitions for recycled content, recyclable, etc.

Support of state efforts to reduce generation of waste at source or at product manufacture.

WRITTEN STATEMENT OF RONALD VAN MYNEN
VICE PRESIDENT, HEALTH, SAFETY AND ENVIRONMENTAL AFFAIRS
UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC.

BEFORE THE
U.S. SENATE SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION
POLLUTION PREVENTION FIELD HEARING
HARTFORD, CONNECTICUT
APRIL 9, 1990

Good morning Senator Lieberman, ladies and gentlemen.

Union Carbide is a multinational corporation with three core businesses -- chemicals and plastics, industrial gases and carbon products. Our corporate headquarters are located in Danbury, Connecticut, and our 46,000 employees, worldwide, serve customers in more than 100 countries around the globe.

Each of our businesses has made significant progress in reducing waste generation and chemical releases to the environment. For example, our domestic chemical plants reduced the annual amount of potentially harmful chemicals released to the air by 45 percent between 1985 and 1988. More recently:

- * Air emissions of SARA Title III, Section 313 chemicals were reduced by 12 percent from 1987 to 1989 and
- * Wastewater discharges of SARA Title III, Section 313 chemicals were reduced by 31 percent from 1987 to 1989.

Our chemical plants cut the frequency of spills and accidental releases by more than a third from 1985 to 1988, and by the end of 1989, they had achieved an overall reduction of 47 percent from their 1985 baseline.

Those same plants reduced the annual amount of RCRA (Resource Conservation and Recovery Act) hazardous solid waste requiring treatment or disposal by 64 percent between 1982 and 1987. The recently compiled 1988 statistics indicate that those plants have achieved a 68 percent reduction from 1982 levels, while production associated with the generation of hazardous waste has increased by 12 percent.

Similarly, our industrial gas plants cut annual air emissions of SARA Title III, Section 313 chemicals by 64 percent between 1987 and 1988; while our carbon products plants reduced the annual amount of solid waste generated by 60 percent in the past eight years and cut their SARA Title III, Section 313 air emissions by 49 percent between 1987 and 1988.

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On the municipal waste side, our corporate headquarters recently initiated one of the first comprehensive corporate programs in Connecticut for recycling paper. In its first six months, the program saved 450 cubic yards of landfill space, spared the equivalent of 2,500 full-grown trees and reduced our waste disposal costs by about one-third.

We believe that a continuing program of pollution prevention is essential -- for Union Carbide and for all of industry. The public demands it, business economics require it and, above all, it is the right thing to do.

This written testimony follows the line of questioning that you posed in your March 26, 1990 letter of invitation. In responding to those questions, I will describe the elements of Union Carbide's pollution prevention program; provide examples of recent pollution prevention achievements at our manufacturing facilities; highlight some of the products, services, technologies and systems that we have introduced to help our customers meet environmental needs; and discuss our long-term commitment to a process of continuous environmental improvement.

QUESTION #1:

WHAT IS POLLUTION PREVENTION AND HOW DOES IT DIFFER FROM POLLUTION CONTROL?

At Union Carbide, we define pollution prevention to include all activities that reduce or eliminate waste generation and the release of pollutants to the environment. We strive to accomplish this through a hierarchy of waste management practices that include source reduction techniques, environmentally sound recycling, and safe on-site waste treatment practices.

Our first preference is to eliminate waste at the source -- before it is generated. We have been able to accomplish this by developing and utilizing improved manufacturing process technologies, by using less toxic and higher quality raw materials and through implementation of better operating, maintenance and housekeeping practices.

When it is not feasible to eliminate waste, our second preference is to recycle or beneficially reuse the waste that is generated. We use some waste as substitute raw materials in other processes. Other waste is cleaned up through recovery operations and sold as secondary products. Still other waste is beneficially reused for its energy or material value.

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Our third preference is to treat the remaining waste on-site to reduce its toxicity, mobility and volume -- in order to minimize or eliminate waste shipments off-site and the release of pollutants to the environment. Thermal treatment (e.g., incineration) and biological treatment are the two most common treatment options utilized at our manufacturing facilities.

We define pollution control, on the other hand, as the management of wastes and pollutants once they have been generated. This includes on-site and off-site treatment, as well as waste storage and disposal. As you can see, there is some overlap in our definition of pollution prevention and pollution control.

We have made substantial progress in reducing waste generation and environmental releases through source reduction and recycling practices, and we believe that there is still much progress to be gained. However, we recognize that source reduction and recycling also have limitations. As a consequence, safe treatment options, as well as environmentally sound waste storage and disposal practices, will continue to be important components of our environmental protection strategy.

WHY IS POLLUTION PREVENTION IMPORTANT?

Pollution prevention is important because it emphasizes the top of the waste management hierarchy -- i.e., source reduction and environmentally sound recycling. Our experience shows that significant economic and environmental benefits can be realized by reducing waste through source reduction and recycling rather than managing it after it has been generated.

QUESTION #2:

HOW CAN FEDERAL, STATE AND LOCAL GOVERNMENT WORK TOGETHER TO MAKE POLLUTION PREVENTION A REALITY?

We believe there are several basic steps that should be taken by Federal, state and local government to make pollution prevention a reality:

- * Establish a uniform national data base to measure pollution prevention progress and environmental quality trends -- build on the best of the existing data bases, and eliminate the rest to avoid unnecessary duplication

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- * Create incentives for pollution prevention and eliminate statutory and regulatory barriers. For example:
 - Streamline the permitting process for environmentally sound recycling
 - Encourage creation of markets for recycled materials
 - Require that plastics be phased into state/municipal recycling programs
 - Provide for equivalent process efficiency demonstrations and allow appropriate credits for early voluntary actions
 - Avoid application of rigid regulatory deadlines, and associated severe penalties, when innovative pollution prevention approaches are attempted -- otherwise, people will tend to stick with the high cost, "tried and true" pollution control options
- * Adopt a national pollution prevention policy that encourages source reduction and environmentally sound recycling, but that also recognizes safe treatment, storage and disposal practices as important components of an overall environmental protection strategy
- * Develop a national pollution prevention strategy that emphasizes net environmental benefits and gives regulators the flexibility to balance the needs of protecting our air, water and land resources
- * Coordinate pollution prevention strategies among EPA's program offices, regional offices and state and local governments
- * Facilitate technology transfer through a national pollution prevention information clearinghouse and state technical assistance programs
- * Increase industry and consumer pollution prevention awareness (and modify their behavior) through education and training initiatives

HOW DOES POLLUTION PREVENTION FIT INTO OUR CURRENT ENVIRONMENTAL REGULATORY STRUCTURE?

We have made substantial progress in improving the quality of our environment with the current regulatory structure. Air quality has improved for many

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pollutants. EPA statistics show that since 1978: sulfur dioxide, particulate and carbon monoxide emissions have been cut by 17, 23 and 25 percent, respectively; and smog-producing organic chemical emissions have been reduced by 17 percent. In addition, EPA estimates that the risks associated with toxic air emissions have been reduced by 50 percent since 1970.

Water quality has improved, too. Some 216,000 miles of formerly polluted rivers in the U.S. are now swimmable and fishable. In addition, EPA reported to Congress last Fall that significant water quality improvements have resulted from industry's installation of best available control technologies -- 76 percent of the river miles evaluated showed an improvement (and that doesn't include the full benefit of the organic chemical industry regulations, which EPA estimates will reduce the industry's toxic discharges by 1.1 million pounds per year).

Despite this progress, our existing environmental regulatory structure is not well suited for the challenges that lie ahead. As we look back over the past 20 years, we can see that our approach to environmental protection has evolved from one single-media crisis to another. First, we wanted clean air. Then, we wanted clean water. Then, better hazardous waste management. This has led to a patchwork quilt of Federal, state and local agencies and single-media program offices that seldom look at environmental impacts beyond their limited sphere of accountability. In almost all cases, they have developed regulatory systems to manage waste once it has been generated, rather than preventing it in the first place. This obviously has created a bias toward single-media, end-of-the-pipe control requirements.

Unfortunately, as we continue to ratchet down on industrial sources, the cost of end-of-the-pipe control technology increases exponentially. And, in many cases, we are reaching the technological and economic limits of that approach.

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QUESTION #3:

- * WHAT ARE SOME EXAMPLES OF POLLUTION PREVENTION THAT ARE IN PLACE AND WORKING?

Union Carbide's waste minimization program is an example of pollution prevention that is in place and working. Our Corporate waste minimization policy was established in 1983. It requires all of our locations to have waste minimization programs in place. The policy also requires that we address waste minimization as we design new processes and operations.

Other important elements of our waste minimization program include:

- * The development of waste management strategic plans for each of our Chemicals and Plastics manufacturing and distribution locations
- * A central, computer-based data management system to improve our ability to monitor progress and identify problem areas that need greater attention
- * Senior management support -- challenging the organization to meet ambitious waste reduction goals and providing the resources to do the job
- * Employee motivation and participation -- encouraging ideas and providing education and training on ways they can reduce waste in the design and operation of our facilities
- * Waste minimization audits and assessments -- since 1987, for example, every major capital project has undergone a formal Waste Minimization Opportunity Review as part of the project approval process. As a result, additional waste reduction measures have been incorporated in over 45 percent of the projects reviewed.

The elements of our waste minimization program and examples of recent waste reduction achievements are described in the enclosed reports, "Union Carbide's Progress in Reducing Waste Generation" and "Toward Environmental Excellence: A Progress Report."

In addition to the important strides our manufacturing and distribution facilities have made in the area of pollution prevention, we have introduced a number of

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products, services, technologies and systems that are helping our customers address environmental needs. Among those are:

SOURCE REDUCTION TECHNOLOGIES

- * UNIPOL polyethylene process technology - the lowest waste generating technology of its kind in the world -- it generates 97 percent less waste and uses 65 percent less energy than the processes that it replaced
- * The UNICARB system for spraying paints and coatings - by substituting recycled carbon dioxide for organic solvents in spray paint and coating formulations, this technology can reduce emissions of smog-producing chemicals from commercial and industrial spray paint and coating operations by 30 to 70 percent
- * GEOLITE & SERT polyurethane foam technologies - new technologies for manufacturing flexible polyurethane foams that can eliminate the use of chlorofluorocarbons (CFCs) as blowing agents and reduce organic solvent emissions by 90%
- * GRAFOIL gaskets - a substitute for asbestos gaskets used in automobile engines and a variety of industrial applications -- it eliminates the health risks associated with asbestos and also provides superior sealing performance

RECOVERY/RECYCLING TECHNOLOGIES

- * UNISON transformer services - based on an environmentally sound technology for removing PCBs from electrical transformers -- it eliminates the threat that existing PCB-transformers pose to the environment and virtually eliminates the need to landfill old PCB-transformers
- * Silicalite molecular sieve technology - an old technology with a new application for the recovery of CFCs from refrigeration and air conditioning systems
- * Multi-plastics recycling - the nation's first full-scale, multiplastics recycling facility will begin operation in 1991 -- it will handle post-consumer plastics including polyethylene wrap, rigid polyethylene containers and polyethylene terephthalate bottles

I will have more to say about our plastics recycling initiative later in this written testimony.

TREATMENT TECHNOLOGIES

- * CANSOLV scrubber technology - a new technology for reducing sulfur dioxide emissions from power plants, industrial boilers and smelters -- it provides 95 to 98 percent control efficiency and results in less than 1 percent of the waste sludge generation that conventional sulfur dioxide control systems do
- * LINDE oxygen combustion system - an advanced system for use in hazardous waste incinerators to improve their performance and reduce emissions of nitrogen oxides by 90 percent

Each of the referenced products, services, technologies and systems are described in greater detail in the enclosed package of information.

Another area where we have made significant progress in pollution prevention is in recycling and beneficially reusing waste materials from our chemical manufacturing operations. For example, about 50 percent of the RCRA hazardous solid waste that we generate is recycled or reused -- as substitute raw materials, secondary products or alternate fuels.

Our Investment Recovery Department, which has been in business for over 25 years, plays an important role in identifying environmentally sound markets to recycle, reuse or reclaim our wastes. In 1989, for example, the Department was able to identify suitable markets for 160 million pounds of process material that otherwise would have been discarded as waste. Through the income that these activities generated and the disposal costs that were avoided, the Investment Recovery Department improved our bottom line by \$40 million in 1989.

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WHAT ARE SOME EXAMPLES OF POLLUTION PREVENTION THAT ARE ON THE IMMEDIATE HORIZON?

In late 1988, Union Carbide's senior management challenged the organization with a new series of waste reduction goals. The goals included the following:

- * To continuously upgrade our technology and operating practices with the ultimate goal of eliminating the release of known and suspect carcinogenic chemicals to the environment
- * To control air emissions so that potential exposure levels in our communities are at least 1,000 times lower than workplace standards
- * To reduce air emissions of five SARA 313 chemicals -- representing about two-thirds of our total -- by at least 50 percent as a first step
- * To establish a culture that keeps waste minimization at the top of the priority list as we design and operate our facilities
- * To eliminate, to the maximum extent practicable, the use of land disposal for process waste, and to develop the combustion capacity to manage our burnable chemical process waste internally
- * To create a mindset that all spills and incidents must be eliminated, and to take precautions so that even major accidents will not have serious effects on our employees, neighbors or the environment

Since that time, teams of business, operations and technical people have been working to identify opportunities and implement projects and activities that will enable us to achieve those goals in a cost-effective manner. Under this program, our people have looked first for source reduction opportunities -- ways to prevent wastes from being generated in the first place. Then, in those cases where source reduction methods were not feasible or were inadequate, they looked at other reduction methods, including recycling and treatment.

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The results of this activity have been very encouraging. Many source reduction opportunities have been identified, such as:

- * Installing floating roofs on fixed roof storage tanks and adding secondary seals to external floating roof tanks
- * Routing process and storage vent emissions to product recovery systems
- * Implementing fugitive emission leak detection and repair programs
- * Installing process components (e.g., valves and pumps) that are designed to lower emissions
- * Upgrading and streamlining processes to improve efficiency and to reuse waste streams

The magnitude of the reductions that we expect to achieve is also encouraging. For example, using EPA's annual SARA Title III, Section 313 data as the basis, our domestic chemical plants expect to reduce chemical releases to the environment and waste shipments off-site by 57 percent by 1993. This includes a 67 percent reduction in releases to the air, water and land and a 30 percent reduction in waste shipments to commercial treatment and disposal facilities. Those projections are based on our best judgment of what technology and business conditions will allow. As with most business activities, we will be reevaluating our forecasts and revising our estimates on a periodic basis to reflect new opportunities and changing business conditions.

Other details of our reduction forecast are included in the enclosed report, "Toward Environmental Excellence ... A Look Ahead."

At this point, I would like to return to the subject of plastics recycling. Of all the pollution prevention activities that are underway at Union Carbide, plastics recycling may offer the most immediate and direct environmental benefit for the people of Connecticut. And, frankly, we need their help to make it work.

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The 40 million pound per year, multi-plastics recycling facility that we plan to build in Piscataway, New Jersey, will begin operation in 1991. We chose that location because of its transportation access and its close proximity to our state-of-the-art polymers research and compounding facility.

Besides processing rigid containers such as milk jugs and soda bottles, this facility will process flexible wrap or film -- mostly commercial packaging material. We will process the polyethylene and upgrade it, using compounding technology that has made Union Carbide a leader in the field. We will produce resins that can be fabricated into household bottles and other useful plastic materials such as pipe and conduit. To be truly successful, plastics recycling must go beyond park benches, sign posts and flower pots. We foresee applications for recycled resins that mirror those for virgin materials, except for food containers, for which Food and Drug Administration standards necessitate the use of virgin materials.

Initially, we will draw primarily on municipalities, counties, brokers and businesses in the tri-state area (New Jersey, New York and Connecticut) for our raw materials -- the bottles and wrap. However, we are looking longer term to serving areas within a 500-mile collection radius -- an area which encompasses nearly 40 percent of the U.S. population. If plastics recycling really develops, we have the infrastructure and land at Piscataway to triple our throughput in the years ahead.

The barriers facing this new business venture are human -- not physical. We know that plastics can be recycled. We have the technology, the skills and, more critically, the markets for recycled products. The big problem is the lack of recycled material. Too few communities are including plastics in their curbside collection programs. New Jersey is leading the way with 8-out-of-21 counties requiring that plastics be separated from household trash for recycling. Unfortunately, Connecticut does not include plastics on its mandatory recycling list.

State and local governments have been reluctant to commit to plastics collection and recycling. Until recently, there has been little reason to take the risk. Many are concerned that collection methods are cumbersome and require reconfigured bins on garbage trucks. Others think that there are no markets for recycled plastics. Well, I can assure you that there are markets. For example, companies like Proctor & Gamble are specifying that a

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certain percentage of recycled material must be used in manufacturing their liquid soap and bleach containers. Also, many of our customers are asking for recycled resins. We are anxious to supply them, but we need the cooperation of all levels of government, as well as individuals, to increase source separation and curbside collection of plastics.

What can government do to promote plastics recycling? At the national level, and in particular in reauthorizing RCRA, you can help in several important ways:

- * Encourage inclusion of plastics recycling in integrated solid waste management plans
- * Use the purchasing power of the Federal government to stimulate markets for plastics, as is now proposed for other recyclable materials
- * Avoid prohibition of interstate transportation of plastics or other wastes destined for environmentally-sound recycling
- * Provide for streamlined siting and permitting of recycling facilities

At the state level, we are hopeful that Connecticut will match our commitment by including plastics in the ten regional collection programs under development. As those programs are implemented, economies can be achieved by siting materials recovery facilities near rail sidings to permit efficient shipment to recycling centers such as the one planned for Piscataway.

Union Carbide wants to make plastics recycling work. And we want Connecticut's plastic waste. We have the experience, the technology and the markets -- but we need a steady supply of plastic waste. That's where elected officials and other opinion leaders must exert their influence to educate and stimulate the public to participate.

I have given you a brief view of Union Carbide's pollution prevention efforts, our recent achievements and our vision of the future. We are committed to a process of continuous improvement in our pursuit of environmental excellence. And, our commitment is shared by others in our industry. Most notable is the Responsible Care initiative of the Chemical Manufacturers Association, whose 170 member companies account for over 90 percent of this nation's production of basic industrial chemicals.

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As a condition of membership, each company has signed a statement of principles, that carries an obligation to achieve the goals set forth in specific codes of practice for emission and waste reduction, transportation of chemicals, emergency planning and other key issues.

Responsible Care is becoming a part of the culture of our industry, and its principles are being discussed by other industry groups here and around the world. Responsible Care is one way of making sure that our industry isn't part of the problem in the future, but part of the solution.

We expect our efforts to lead to more efficient and profitable chemical manufacturing operations. Waste management costs should diminish. And our liabilities should also be lower in the future. Most importantly, we believe that these efforts will help build and maintain the confidence and support of our customers and the general public. We will need that in the future, if we are to expand our facilities and introduce the new products and services that will be needed to help improve our environment and our quality of life.

Thank you.

RVM0406

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